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AND

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Agriculture and the Mechanic Arts are the basis of Civilization.

M. TARVER & T. F. RISK,
EDITORS AND PROPRIETORS.

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THE

WESTERN JOURNAL.

M. TARVER AND T. F. RISK, Editors and Proprietors.

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THE

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Article I.

MISSOURI.

The history of the past is of little use to one ignorant of existing facts: the genius of the present age, the social condition, intelligence, and pursuits of the people; the geographical relations and physical resources of the country are facts which must be known before we can make a practical application of historical knowledge. In general, individuals, who devote much time to literary pursuits, pay but little attention to the study and investigation of subjects relating to the present or future condition of their own country. Their minds become familiarized with, and delight to dwell upon, distant events and remote objects, whether of time or place; while they seem to regard those things which lie within the sphere of their more immediate observation, as unworthy of contemplation, and incapable of affording either pleasure or profit: nor is this state of mind peculiar to the literary portion of our countrymen. Few of our people, whatever may be the grade of their intelligence, seem to regard a knowledge of the resources of their respective States as an accomplishment worth the time employed in its acquisition; and but few, we believe, even cultivate a taste for the improvement of their own homesteads. These observations may be regarded as applicable to the American population at large; but nowhere else have we observed a people whose appreciation of their own country was so low as seems to have been that of the inhabitants of Missouri in times past; and we are persuaded that it is owing, at least in part, to this cause that the settlement of this State has progressed by such slow degrees.

During a residence of nearly thirty years in different frontier settlements, we have always observed a desire manifested on the part of the early inhabitants to encourage emigrants to settle amongt them: but such does not seem to have been the case in Missouri. Whether this peculiarity of the Missourians was owing to an honest conviction that people could do better anywhere else

than here, or to a feeling of exclusiveness, need not be discussed in connection with the present subject: but the time is fresh in the memory of many, when emigrants to Missouri were regarded with caution, if not with some degree of suspicion: and many were the surmises of the older inhabitants as to the causes which expelled the intruder from the community whence he came—they seemed to be unconscious that the country itself offered any inducements.

Nor have the resources of the State been properly understood and appreciated in other parts of the Union. The mild climate and varied products of the central region were less attractive to the enterprising emigrant than the staples of more southern and northern latitudes; and consequently Missouri and Southern Illinois, though inhabited by white men at an early period of Western history, have not been settled, and their resources developed with that degree of rapidity which has distinguished the growth of other parts of the West.

A change, however, in this respect has taken place within a few years past; and if the spirit of enterprise, which has been awakened in Missouri and Illinois, should be fostered by the people, and encouraged and sustained by judicious legislation, the progress of these States in population and wealth will, henceforth, far exceed that of any other part of the continent of equal area.

The many advantages of the central region are beginning to be understood and appreciated. This is the true region of Indian corn, of grass, of grapes, of pork and of beef; also, of hemp and tobacco. Wheat, and all other grain bearing cereals; potatoes, flax, and wool may all be cultivated with profit. It is also the true apple region; while it produces almost every variety of other fruits that thrive elsewhere in the temperate zone. And, if in connection with these products we take into consideration its boundless mineral resources, we shall discover that the elements of wealth and comfort are more abundant and varied than on any other part of the whole earth; and the time is near when men will wonder how it happened that a country so much to be desired remained unimproved so long after its discovery.

We deprecate the practice of extolling a country above its merits. We would not willingly mislead the humblest emigrant that may ever reach our shores: and therefore we should say that, notwithstanding the boundless resources of this region, none should imagine that wealth can be obtained without industry; or, that these resources can be developed without enterprise. But it may be safely affirmed that in no other country are the rewards of labor more sufficient and certain; or the inducements to the undertaking of individual and social enterprises greater. Every department of industry is based on a more permanent foundation in Missouri than in the Northern or Southern States. No pursuit indicated by the climate and natural resources of the country, when once established here, can ever suffer materially from the competition of other

States, or foreign nations. Our bread and provison staples are so varied that, in the ordinary course of providence, seasons of scarcity must be less frequent here than in almost any other part of the whole earth; and, owing to these and other causes we shall not be liable to the frequent and severe pecuniary revulsions that occur in countries where a large portion of the inhabitants subsist on the food, and labor on the raw material, produced in distant lands.

Nor is the growth of this region less interesting in a social and national point of view: the development of the centre will constitute a social barrier between the North and South, neutralize their prejudices, and serve to hold in check the efforts of each to control and give direction to the policy of the Nation. Genius, talent and learning will be naturally attracted to the centre; because here they can exert a greater degree of influence upon the minds of their contemporaries. And here will congregate the arts which embelish and refine, as well as those calculated to produce wealth and comfort: and finally, whether for good or evil, the central States will not only give form and tone to our national character but control the destiny of modern civilization. This is no chimera. Man, in connection with this subject, is to be regarded as the offspring of nature; and, resist her influences as he may, she still asserts her prerogative and impresses upon her children of different climes, distinctive forms and colors, indicating the region of their origin; and harmonizes their mental and moral natures—their tastes and desires—with the physical condition of the country they inhabit. The correctness of these conclusions is sustained by the history of civilized man, from the earliest ages to the present day; and however reluctant the more northern and southern States may be to assent to these views, we are persuaded that every intelligent and well informed individual will recognize their conformity with the laws of nature and the active influences that mould the character and control the destiny of man in every state of his social existence.

The history of the European race in Missouri is embraced in a period scarcely exceeding the life of one individual. In 1820 the State contained but 66,586 inhabitants; in 1850 the population had increased to 682,907. And although her progress has not been equal to that of some of the other new States, yet, when we take into consideration the effects of those causes which have been noticed as retarding her growth, and the accelerated increase which has taken place within a few years past, we find strong reasons in support of the opinion that her future career will be unrivalled by any other State in the Union.

It may be admitted that Illinois contains a larger quantity of fertile soil, in proportion to its area, and that in a commercial point of view its location is not less favorable; but the vast mineral resources of Missouri constitute an element of wealth which, in connection with her agricultural capacity, will in time place her

the first on the list of American States. For it must be remembered that the wealth drawn from the mines, so far from diminishing her agricultural capacity and profits, is calculated to increase both, by affording a home market for a greater variety of products.

The causes which hindered the growth of Missouri in times past are gradually disappearing; and others calculated to promote its progress, are beginning to operate with manifest efficiency. As evidence that a decided change is already going on, we notice that the increase of population for the two years ending in 1850, was 93,936, being 16,902 more than the increase of the four years ending in 1848, and we learn through the public Journals from different parts of the State that the emigration this season exceeds that of any previous year.

Our railroad projects, if prosecuted, will greatly accelerate the settlement of the districts through which they are located; and if nothing should occur to check the present tide of foreign emigration, it may be regarded as a reasonable estimate to set down the population of Missouri at one million and a half in eighteen hundred and sixty; but that would give us only about twenty inhabitants to the square mile, scarcely a tithe of the number that she is capable of supporting in a comfortable condition. With a population as dense as that of Massachusetts, Missouri would contain about 10,000,0000 inhabitants, and we hazard the prediction that even a greater number will be attained in the lifetime of many now in existence.

We have taken this hasty glance at the present condition and future destiny of Missouri, not in a spirit of boasting, but for the purpose of suggesting to the minds of our citizens a profitable train of reflection. The youth who is about to enter upon the serious business of life, should contemplate the effects which will be likely to flow from the mighty changes we have indicated, and project his plans with reference to their occurrence. The time is propitious for laying the foundation of his fortunes; and by the exercise of a reasonable degree of industry and economy, if his schemes of life be well digested, the current of events will bear him on to the attainment of all that he can reasonably desire.

The man of riper years who is looking forward to the education and establishment of his children, may profit by recurring to these views: he should bear in mind that his offspring are destined to act their parts in a community widely differing in its condition from that to which he himself has been accustomed; and should study to prepare them for that state of society in which they are destined to act as members.

The vision of the political economist, who aims to give direction to the varied pursuits of mankind, must continually embrace the future; or the changes going on will falsify his doctrines even before they are promulgated. He must study profoundly the resources of the next generation, as well as the wants and conveniences

of the present; for the purpose of judging how the burthens incident to social progress may be distributed, and so imposed that each shall be made to bear their just proportions. For, although praiseworthy, yet, it would be an unreasonable sacrifice on the part of our present population to exhaust their means in making improvements for the enjoyment of the five or, perhaps, ten million inhabitants of the next generation, without transmitting a portion of the burthen with the benefits. This is a question upon which the progress of improvements in Missouri must, in a good degree, depend for some years to come; and it may be profitable to give it a passing consideration in connection with our subject.

We are aware that a very respectable and prudent class of men hold the doctrine that neither individuals nor governments should incur an obligation with a view to its being discharged by their successors. This may be a sound maxim in countries whose resources are fully developed, and where the population has reached its maximum; but cannot be regarded as applicable to a state in the condition of Missouri. Let us take the case of our projected railroads as an instance. Any attempt to construct them by means raised immediately from our citizens would be perfectly vain; nor is it probable that the time will arrive during the existence of the present generation when these works would be undertaken upon this principle. And if we suppose the next generation, convinced of the importance of the work, should undertake its accomplishment, they would be compelled to pay the entire cost: and would consequently be in no better condition than if we had done the work entirely on their credit, provided we pay the accruing interest. Then it would seem to follow that whatever amount we may pay towards the construction of permanent works, whether it be five, ten, or fifty per cent of their cost, is so much bestowed upon those who succeed us. But in Missouri it would not be the descendants of our own citizens only that would enjoy the benefits of their labor and enterprise; but emigrants from other States and foreign countries would come in for much the larger share.

Upon the principle of dividing the burthen of making permanent improvements between the present population and that which we may reasonably expect to have twenty years hence, it is in our power to carry out a thorough system of internal improvements with complete success, provided due regard is had to the amount that may be invested without materially affecting the ordinary pursuits of the community.

But after all that may be said, the burthen of our successors is only contingent; for in case the value of the property created remains equal to its cost, they will be fully indemnified for the discharge of the obligations which may become due in their time.

We have made this digression in view of the question which is being discussed in many counties in our State touching the policy of subscribing for stock in works of public improvement. We

have considered the subject in all its aspects, and feel persuaded that no other method yet devised for raising the means of constructing public works, is more safe to the community; nor, in a social point of view, more just in its operations than county subscriptions. By this means the property of every individual is brought to bear upon social objects; and the selfish speculator on the enterprise and public spirit of his neighbor is made to impart something for the benefits which he derives from public improvements.

We are pleased to learn that county bonds are beginning to be favorably regarded by capitalists, as a safe mode of investment, and should their credit be sustained by the punctual payment of interest, they are likely to become one of the most efficient social agents that has yet been discovered.

In reference to the future population and wealth of Missouri, we have said: she was destined to occupy the first place in the list of American States; but it will depend mainly on the present generation whether her moral grandeur shall correspond with her wealth and numbers. The privilege of giving direction to the social institutions, and tone to the moral character of the millions who are to succed us, cannot be too highly appreciated by every citizen of Missouri. The foundations of the social and moral institutions of this mighty State are to be laid by us of the present generation; and where is the individual so regardless of the future glory of his State, and the approbation of his race as not to desire that his name should be recorded as a coadjutor in this great work? Improvements in the moral and social condition of a people are of all human undertakings, deemed practicable, the most difficult. A slight error tolerated, or perhaps unperceived, in the beginning takes deep root, and gaining strength with time, becomes so interwoven with the social fabric that its entire eradication defies every human effort. Hence we should aim to exclude from all our institutions every vicious principle, and transmit them, if possible, to our successors free from every vice that may tend to corrupt and destroy them. And let us continually bear in mind that our duties are commensurate with the privileges we enjoy; and, that we shall incur the just censure of mankind and the displeasure of the Creator if we neglect to improve the talents committed to our keeping.

ARTICLE II.

CHEVALIER CLAUSSEN'S IMPROVEMENTS IN THE PREPARATION OF FLAX AND IN BLEACHING.— THE SPECIFICATION.

From the London Mechanics' Magazine.

We have now the pleasure (exclusively we believe) of laying before our readers the specification at length of the important improvements in the preparation of flax, by Chavalier Claussen, which have recently attracted so large a space of public attention, and were emphatically referred to by Sir James Graham in the Free Trade Debate in the House of Commons (Feb. 13), as giving promise of a new career of prosperity to both the farmers and manufacturers of this country. Sir James had been present the day before, at a Meeting of the Council of the Royal Agricultural Society, when a long and interesting paper on the subject, by Chevalier Claussen, was read, but which did not enter into any of the details of the new processes by which the improvements in question are effected. The paper, after treating, first, of the reasons in favour of an extended cultivation of flax and hemp in the United Kingdom—of which the chief are, the relief it would afford to the agricultural interest, the deficiency of the existing supply of cotton, and our dependence for even that limited supply on foreign countries—then proceeded to show the suitableness of our climate and soil to the growth of these plants, and the large profits which the landowner and farmer might fairly anticipate from an application of their industry in this direction. The existing processes were next discussed: and as a knowledge of these is very necessary to a clear comprehension of the value of the improvements which Chevalier Claussen has introduced, we extract the following particulars from this part of his paper:—

Under the system of preparing the flax, hitherto followed, four modes of steeping or "retting" the plants are resorted to. The first consists of the plan of *dew retting*, or allowing the flax to remain exposed on grass land for a considerable number of days exposed to the action of the rain, dews, and atmosphere. The plan, however, is one which, from its obvious inconveniences, is not calculated to meet with general approval in the present advanced state of agriculture, and is indeed very rarely adopted.

Probably the best mode of steeping the flax is that of placing it *in running streams*, according to the mode adopted in Courtrai, the principal flax-growing district in Belgium. The flax so prepared generally realises a much higher price than any other description of flax. There are, however, certain peculiarities in the waters of the river Lys which makes it admirably adapted for

steeping purposes. and which are not possessed by any streams in this country. Independent of the peculiarities of the water, the steeping of flax in running streams cannot be made generally available in this country, as they are mostly too rapid in their character.

In the absence of suitable streams, recourse is had to a mode of *steeping in pits or pools.* But so many favorable conditions are required to be obtained, and so many unfavorable ones to be avoided, in the selection of the site for the pool, and the supply of the water required, that it is probable a desirable or perfect steep pool could not be formed in any part of the country. The soil forming the bottom and sides of the pit will have an influence on the colour of the fibre; clay, gravel, alluvial and peaty soil, will each impart some peculiar dye to the material, which more or less affects its value. The water used in the pit or pool must not be spring water, and it must not have flowed over any soil containing metallic deposites; and rain-water is not well calculated for the purpose. But, in addition to all these difficulties attendant upon obtaining the requisite means, the grower of flax has to contend against all the uncertainties and risks of either over or under-steeping his flax. "One sultry night," says one of the reports of the Royal Flax Society, "while it is in the steep, and nearly rotted sufficiently, is enough to carry the fermentation beyond the safe point. So much is this feared by farmers, that almost all flax is underwatered; and although much of it is afterwards watered on the grass, yet the great proportion is brought to market with the shoves still unseparated in bits on the fibres." But while the sultry nights of summer are unfavorable to the steeping of flax, and inconvenient to the farmer, inasmuch as his labourers are at that season generally otherwise employed, it is also obvious that during the winter, when comparatively little farm labor is carried on, the process of steeping must be discontinued in consequence of the temperature.

A fourth process has within the last few years been very strenuously advocated by the Royal Flax Society in Ireland, which consists in *steeping the flax in hot water.* This mode (Shenck's), although doubtless an improvement upon any of the existing plans, still does not afford the means of obtaining that complete separation of the fibres which it is desirable to obtain.

* * * * * * *

Not only is the present process of steeping inconvenient and unnecessary, but it is highly injurious, as it imparts its injurious dyes to the fibre, deteriorates it, and gives to it an inequality of strength, which in the subsequent stages of manufacture, are exceedingly difficult to be overcome. I have found this to be more particularly the case in the preparation of the flax into a material capable of being spun alone or in combination with wool and cotton upon the existing machinery.

The more striking features of Chevalier Claussen's process, as distinguished from the preceding, were stated to be these:

1. That by this process the preparation of long fibre for scutching is effected in less than one day, and is always uniform in strength and entirely free from colour, much facilitating the after process of bleaching either in yarns or in cloth.

2. That he can also bleach it in the straw at very little additional expense of time or money.

3. That in consequence of a more complete severance of the fibres from each other, and also from the bark and boon, the process of scutching is effected with half the labour usually employed.

4. That by the new process flax is rendered capable of being spun, either in whole or in part, on *any existing spinning machinery*.

5. That the fibre to be mixed with cottons or spun alone on cotton machinery, is so completely assimilated in its character to that of cotton, that it is capable of receiving the same rich opaque colour that characterises all dyed cotton; and, consequently, any cloth made from flax-cotton yarn can be readily printed, dyed, or bleached by the ordinary cotton processes.

6. That with respect to the advantages of being able to spin flax in combination with wool, on the existing woolen machinery, the first is, that the flax prepared by M. Claussen is capable of being "scribbled," "spun," "woven," and "milled," in all respects as if it were entirely wool; having an advantage in this respect over cotton, which has not the slightest milling properties; on the contrary, the flax fibre is capable of being even made into common felt hats with or without an admixture of wool. To such an extent has the milling property of flax been proved, that a sample of cloth was exhibited which had been woven to 54 inches wide, and milled up to 28 inches wide.

7. That the flax-fibre will not, under any circumstances, when prepared for spinning with wool, cost more than from 6d. to 8d. per lb., while the wool with which it may be mixed will cost from 2s. to 4s. per lb.; consequently reducing the price of cloth produced from this mixture 25 or 30 per cent. below the present prices of cloth made wholly from wool, and being of equal, if not greater, durability.

8. That short-wool refuse, which cannot by itself be spun into a thread, may, by being mixed with this thread, be readily spun and manufactured into serviceable cloths.

9. That by this process flax may be also so prepared as to be spun in any certain proportions, with silk upon the existing silk machinery; that when so spun, it is capable of receiving considerable brilliancy of tint. That the fibre may be prepared for thus spinning at an uniform price of from 6d. to 8d. per lb. That as it may be spun in any proportions with silk, it is evident that the price of the yarns must be reduced according to the relative pro-

portions of the materials employed; thus extending the markets, and giving increased employment to the operatives.

In evidence of these advantages, the Chevalier laid before the Meeting the following specimens:

1. Samples of flax in the straw pulled and rippled.
2. Sample of flax-straw, prepared according to the new process, adapted for linen manufacturers.
3. Sample of long fibres scutched from the above.
4. Samples of pure flax-fibre, or "British cotton," adapted for spinning on cotton machinery.
5. Sample of yarn spun on cotton machinery, some from all flax-fibre, others mixed in various proportions with American cotton,—these mixtures being termed by the inventor flax-cotton.
6. Samples of flax-fibre prepared for mixing with wool.
7. Samples of yarn produced on ordinary woollen machinery, composed of wool and flax in various proportions, termed by the inventor flax-wool.
8. Samples of flannel woven from the above.
9. Samples of fine cloth woven from yarn composed of flax and fine wool in various proportions and dyed.
10. Flax-fibre prepared for mixing with silk, and dyed of various colours.
11. Flax-fibre mixed with spun silk, and termed by the inventor flax-silk.
12. A sample of yarn produced from the above.
13. Samples of flax-cotton yarn dyed of various colours.
14. Samples of cloth woven from flax-cotton yarn and wool, dyed.

We shall now proceed to give Chevalier Claussen's specification itself; but before doing so, may point out to the reader that the Chevalier's patent embraces, besides his improvements in the preparation of flax and hemp, and in yarns made from these and other materials, some new processes in bleaching generally, which appear to be only second in importance to those relating to flax; since by one of them (the ingenious double decomposition process) the same bleaching liquors may be used over and over again, without any other loss than necessarily attends their manipulation.

THE SPECIFICATION.

Firstly, my said invention, in so far as respects improvements in bleaching, has reference to the bleaching of all kinds of vegetable productions, and of fabrics or articles composed of such productions, and consists of the following improved processes:

In the usual methods of bleaching fabrics, such as calico, the goods are first immersed in a bleaching liquor (commonly the solution of hypochloride of lime, the "chloride of lime" of commerce), and then are steeped in a bath of water, acidulated with

sulphuric acid. By this plan the chlorine is set free, either in its simple form or in combination with oxygen (as chlorous or hypochlorous acids), or in chemical union with the hydrogen of the water (as hydrochloric acid), and thus either is wasted, by its escape, or is rendered injurious to the fabric, by remaining too long in contact with it.

Now instead of this, I adopt the following process, whereby the whole, or a great portion of the chlorine, or chloro-compound, is kept in a combined state, and recovered for future use. By the term "*chloro-compound*," I do not mean a *salt containing* "*chlorine*," but an acid having "chlorine" for its basis, such as chlorous or hypochlorous acids.

In this process, then, of bleaching, I take the goods, after they have passed through the bleaching liquor (say a solution of the hypochlorite of lime), and then steep them in a strong solution of some salt, whose acid has a more powerful affinity for lime than hypochlorous acid; thus a strong solution of sulphate of magnesia may be employed, the sulphuric acid of which, having a strong affinity for lime, combines with the earthy base of the bleaching salt above-mentioned, and forms sulphate of lime, and the chloro-compound being thus liberated, unites with the magnesia of the sulphate of magnesia, and forms a new salt (hypochlorite of magnesia), having bleaching properties similar to the lime salt first employed.

This newly-formed compound may be, in the next instance, used as a *primary bleaching agent*, and may again be subjected to the process of double decomposition, as in the foregoing example. Thus, the goods having been exposed to the action of hypochlorite of magnesia in solution, may then be steeped in a liquid holding in solution some carbonate or other salt, for whose base the hypochlorous acid has a greater affinity than for the magnesia. In such a case, the carbonic acid having also a strong attraction for the magnesia, combines with it, to form a carbonate of that earth, and the liberated chloro-compound, instead of escaping, or remaining so long in contact with the goods as to injure them, combines with the base of the carbonate employed to produce decomposition, and forms a new salt having bleaching properties. This salt may also be brought under the same laws of double decomposition, as examplified before, and with similar results. Thus, if the carbonate employed in the foregoing instance had been carbonite of barytes, and a solution of sulphate of magnesia, or of lime, were brought into contact with the resulting chloro-compound salt of barytes, a precipitate of the base as a sulphate of barytes will take place, and the chloro-compound will unite with the lime or magnesia, to form a bleaching salt.

I would mention, however, that, in bleaching flax, or other like vegetable material for making linen, no compounds should be used which are likely, during their decomposition, to evolve any gaseous

matters such as carbonic acid or chlorine, as, by their development and expansion in the fibrous tubes, the flax, or any similar material, would be rendered not so fit for spinning with the ordinary flax-spinning machinery; but in bleaching flax, or any similar material which is to be combined with other materials for spinning and felting according to my invention, compounds evolving gas may be safely used, as I shall hereafter more fully specify and explain.

For the purpose of bleaching by the method of double decomposition, I do not confine myself to the compounds already mentioned as examples, nor to any particular salts or class of salts; but I claim a right to use any which, when placed under the like circumstances, as before examplified in the case of goods treated by the hypochlorite of lime and the sulphate of magnesia, will be subject to the same chemical law of decomposition, and will produce the same result.

However, I may particularise as among the salts suitable for decomposing the chloro-compound salts, or assisting themselves in the process of bleaching, the carbonates (such as the carbonate or bicarbonate of soda), sulphates (as sulphate of magnesia, &c.), nitrates (as nitrate of soda, &c.), acetates (as acetates of potash and of lead, &c.), prussiates (as prussiates of potash, &c.), chromates (as chromate and bichromate of potash, &c.), tartrates (as tartrate and bitartrate of potash, &c.); but I repeat, that I do not confine myself to these which are merely given as examples.

Another mode of bleaching which I sometimes employ, and which is especially applicable to goods composed of both animal and vegetable fibres, is as follows:—I take the goods, after they have been steeped in any of the ordinary bleaching liquors, such as the solution of hypochlorite of lime (chloride of lime), and while they are still wet I expose them to the fumes of sulphur, slowly burning in a suitable chamber or stove. In this case, I have two powerful bleaching agents at work, viz., the hypochloric compound and the sulphurous acid produced by the combustion of the sulphur. A portion of the sulphurous acid combines with the base of the chloro-compound salt, to form a sulphite of lime or magnesia, as the case may be, and a small portion of sulphuric acid may also in this case be formed, which, with the earth or base, would form a sulphate. In this way the chlorine, or chloro-compound, remaining in the wetted goods is liberated, and allowed to act freely upon the articles to be bleached. In this last method of bleaching I have ascertained that there may be occasionally substituted for the ordinary and known bleaching liquids, certain chromates, manganates and hypermanganates, &c.

Secondly. My improvements in the preparation of materials for spinning and felting have especial relation to flax and hemp, and other plants to which the same may be applicable; and the processes I use to prepare the same, though possessed of some features common to the whole, vary according to the purposes to

which the fibre obtained from the said materials is to be applied—that is to say, according as the fibre is required to be long or short, fine or coarse, and the machinery in which it is to be spun is adapted to the spinning of one or other sort of fibre.

By the term "*fibre*," as used throughout the specification, I mean that portion of each plant which is capable of being spun or felted; and my invention applies to the "fibre" surrounding the stems of dicotylidenous plants, and to that existing in the stems and leaves of monocotylidenous plants.

In the following examplifications of my improved modes of preparation, I shall throughout suppose flax or hemp to be the material operated upon.

If I have to deal with the plant from the time of its being first cut down or pulled for use, I take it in the state of straw (after the seed has been stripped from it), and subject it to the following, which I call my "primary process:"—

I first steep the straw in a solution of a caustic alkali of about one degree of Twaddel's hydrometer, and for such a length of time as may be most convenient. If despatch is required, I use the solution in a boiling state; in which case an immersion of about six hours is sufficient. If more time can be conveniently allowed, I employ a solution of a temperature of about 150° Fahrenheit, and prolong the immersion for about twelve hours; and so in proportion to the degree of temperature. The solution may be even used at a lower temperature, with a corresponding prolongation of time, but in no case need the immersion exceed a couple of days at the utmost.

The object of the preceding treatment is twofold:—First, to decompose, dissolve, or remove (more or less, as required) the glutinous, gummy, or other matters which connect the fibre with the woody portions of the plant, and, second, to discharge or decompose any oleaginous, colouring, or extraneous matter contained in the straw, without allowing the matters so discharged to stain the fibre; and these results are obtained by the action of the alkaline solution.

In the preceding mode of preparing vegetable materials, I generally use a solution of caustic soda; but other alkaline liquors will answer the purpose,—such as a solution of caustic potash, or of lime dissolved in or diffused in water; or, indeed, any substance having the like power of removing, discharging, or decomposing the colouring, glutinous, gummy, or other foreign matters contained in the straw, and which would interfere with the whiteness of the fibre, or with its ready separation and manufacture.

If the fibre is required to be long, like that commonly spun in flax machinery, I subject the straw to a second process, for the purpose of getting rid of any of the alkali still adhering to the straw or fibre, and for the purpose of completing (if necessary)

the removal of any glutinous, gummy, colouring, or extraneous matters.

To this end I take the straw from the alkaline solution, and steep it for about two hours in water acidulated by sulphuric acid in the portion of about one part of the acid to from two to five hundred parts of water. Some other dilute acids will also answer this purpose, such as dilute muriatic acid, &c.; but sulphuric acid is to be preferred. Or, I transfer the straw, while yet wet with the alkaline solution, to a suitable chamber or stove, where I subject it to the action of sulphuric acid, or the fumes produced by the slow cumbustion of sulphur. In both cases the acid combines with any free alkali, remaining on the straw or fibre to form a sulphite or sulphate, according to the acid employed; while an excess of either sulphuric or sulphurous acid will complete the decomposition, discharge, or removal of the glutinous, colouring, and other matters.

I next remove the straw from the acid bath, or sulphur-chamber, or stove, and wash or otherwise treat it with water, till all soluble matters are removed.

If the fibre is required to be decolorised, the straw may now be exposed to one of the bleaching processes which I have already described, or to any of the other known processes. It may then be dried, and made ready for breaking and scutching by the means ordinarily followed in the manufacture of long flax.

I would mention here that, in some cases, it will be found advantageous to pass the straw between rollers, or to break it roughly or partially, before subjecting it to the process above described, for the purpose of facilitating the action of the chemical agents upon it.

By the aforesaid method, I am enabled to remove from the straw certain matters which water alone cannot discharge. The fibre thus prepared is also freer to heckle, and the straw more easy to scutch, than fibre and straw treated in the ordinary way. Much time and much material are also saved: while the noxious exhalations attendant upon the water-rotting system are wholly prevented.

If the fibre is required to be short, so that it may be felted or carded, and adapted for spinning on cotton, silk, wool, worsted, or tow, spinning machinery, either alone or in combination with cotton, wool, hair, fur, silk, or shoddy, I take the fibre, after treating it by the processes just described, and divide it in proper lengths by some suitable instrument or machine. I then transfer the straw or fibre to a bath containing a strong solution of bicarbonate, or even carbonate of soda, or any other similar compound; but the first two of these are to be preferred as most abounding in carbonic acid. In this bath I allow it to remain for about three or four hours, during which time the fibre becomes well saturated with the salt. I then immerse the material impregnated with the solution of the carbonates before named, for about a couple of hours, in water acidulated by sulphuric acid, of about the strength of

one part of acid to two hundred parts of water. Or instead thereof, I expose the saturated materials while wet to the action of burning sulphur in a suitable chamber or stove.

In this operation it appears that a certain portion of gas being developed in the fibrous tubes, splits and divides them by its expansive power into filaments, having the character and appearance of fine cotton wool; in which state they may be dyed and manufactured like cotton or wool.

The same means of effecting the splitting of the fibre may of course be employed in the preparation of long fibre, and I do not limit myself to its use for the preparation of short fibre alone, but when the fibre is of its original length, the solution employed takes a longer time to penetrate the interior.

The decomposition of the bicarbonate of soda or other suitable compound, with which the fibre is saturated, may be also affected by means of electric agency, when a like evolution of gas and splitting up of the fibre will take place.

After the fibre has been subjected to the splitting process, it must be carefully washed to remove all soluble matters, and then dried.

The splitting process may be applied to the plant either in the straw (the wood of which is to be afterwards removed by proper means and machinery), or in the state of long fibre, whether prepared by my before described process, or by any of the usual and known processes.

Thirdly. My invention, in so far as it relates to improvements in yarns and felts, consists in composing the same of the following new combinations of materials. I manufacture a yarn which I call "flax-cotton yarn," composed partly of flax fibre, prepared and cut into short lengths, as aforesaid, and partly of cotton, varying the proportion at pleasure. This yarn is much stronger than yarn composed of cotton alone, and also much whiter and more glossy, while it is equally capable of being spun in the ordinary cotton-spinning machinery.

I also manufacture yarns, composed in like manner, partly of hemp fibre, or of jute, or of phormium tenax, or of other like vegetable fibre (China grass excepted), prepared and cut into short lengths, as aforesaid, and partly of cotton, which yarns each possess the same properties (more or less) as the flax-cotton yarn.

I manufacture also a yarn, which I call "flax-wool yarn," composed partly of flax prepared and cut into short lengths, as aforesaid, or of any other like vegetable fibre (cotton and China grass excepted); and partly of wool, or of that description of it called "shoddy," or partly of the fur or hair, or partly of any two or more of the said materials; which yarn is stronger than any yarn composed of wool alone. Some wools aslo, which are too short to be spun by themselves, may, by being mixed with flax-fibre, cut into short lengths, form a material very suitable for spinning.

I manufacture also a yarn, composed partly of flax, or other like vegetable fibre (China grass excepted), prepared and cut into short lengths, as aforesaid, and partly of waste silk; that is, silk of the short lengths in which it exists before reeling, or silk rags cut into short lengths and carded.

Lastly. Flax felts, of a fineness and softness equal to the best felts, composed wholly of wool, and superior to them in point of durability, are also produced by a mixture of flax-fibre, prepared and cut into short lengths, as aforesaid, with wool, fur, hair, or any other feltable material.

And I declare that what I claim as secured to me by the said letters patent, is as follows:

First. I claim the method of bleaching by double decomposition, before described, whereby the various bleaching agents and compounds used may be recovered and economized.

Second. I claim the method of bleaching by the combined action of chlorides, or carbonates, or chromates, or any other bleaching agent, with fumes of sulphur, as before described.

Third. I claim the preparing of flax and hemp, and of all vegetable fibre capable of being spun or felted, from whatever description of plants obtainable, by steeping the plant from which the fibre is derived, while in the state of straw, stem, leaf, or fibre, first in a solution of caustic, soda, or other solution of like properties, and then in a bath of dilute sulphuric or other acid, as before exemplified and described.

Fourth. I claim the preparing of the said vegetable fibre for spinning in cotton and silk machinery, and for being combined with cotton, wool, raw silk, or other materials of sort staple, by firstly steeping the same in a solution of caustic, soda, or other solution of like properties. Secondly, steeping them in a bath of dilute sulphuric, or other suitable acid, or exposing them to the fumes of sulphur. Thirdly, saturating them with a solution of bicarbonate of soda, or any other like agent, and then decomposing such salt, however such decomposition may be effected; and, Fourthly, cutting them up into short lengths, all as before exemplified and described.

Fifth. I claim the employment generally in the preparation of flax, hemp, and other sorts of vegetable fibre, of the mode of splitting by gaseous expansion, as before described, whether the fibre is long or short, and whatever may be the purpose to which the same is to be applied.

Sixth. I claim the manufacture of yarns and felts from a combination of flax, or like vegetable fibre (China grass excepted), prepared and mixed, as aforesaid, with cotton wool, "shoddy," silk waste, fur, and hair, all or any of them as before exemplified and described.

Article III.

INFLUENCE OF COMMERCE UPON LANGUAGE.

Effects of Commerce upon Language—Commerce influencing Language—Copiousness caused by extensive Commerce—Advantages of a copious Language—The American—English—Greek—and Roman Languages—Deficiency in the American and English Languages—Probable progress and present position of the American Language.

(From the Merchants' Magazine.)

The effects of the Commerce, or of the commercial action of a nation upon its language, are very significant. National language, by the aid of Commerce, its attendants and consequents, becomes copious, expressive and influential: and, in proportion to the extension and increase of Commerce, the arts and sciences, language variegates and expands. A narrow and exclusive community, having intercourse by commercial traffic or otherwise, with but few other communities, must necessarily have occasion for fewer words, and a less number of ideas than those whose commercial privileges are more numerous,—and whose business intercourse and capacities are more extensive. In such limited communities, we see the condition of nations or tribes, in respect to language, like the North American Aborigines, whose language, though energetic, was too sparse or barren to serve the purposes of familiar conversation;—and in order to be understood and felt, it required the aid of strong and animated gesticulation. We plainly observe then, that the wider and farther a nation's Commerce, with its concomitants, extends, the more excursive and comprehensive will be its lingual capacities. Words and ideas become matters of international exchange or acquisition; and Commerce the bridge over which they travel from country to country.

A language acquires copiousness and richness by the addition of terms and phrases "borrowed," and introduced, from the languages of other countries. Every new commodity, art and object, every new idea or invention, arising from conjunctive national minds, is followed by a name or meet expression. And each "winged word" is brought to the store-house of national language. A cultivated, copious language, derived from, or belonging to, any commercial people of the present time, will exhibit, in its constituent elements, many words directly introduced or derived from ancient and modern nations; and due attention to the sources of these words, will develop their nativity in the vernaculars of various nations of the Globe. A glance, for example, at the ingredients of our own language, exhibits the words. cherub, corban, eden, leviathan, sabbath, satan, seraph, &c., to be from the *Hebrew;* alphabet, anthem, chronometer, gymnasium, hydraulic, orthography, rhetoric, from the *Greek;* animal, artisan, adage, coinage,

epitome, honor, litigant, quadrant, valor, from the *Latin*. We also find antique, boquet, clique, epaulet, gaiety, levee, suite, tirade, tour, unique, &c., to be derived or borrowed from the *French*; allegro, casement, fresco, galvanism, from the *Italian*; alcove, anchovy, castanet, embargo, tornado, from the *Spanish*; alchemy, alcohol, almanac, amber, crimson, syrup, zenith, from the *Arabic*; bazaar, pagoda, zest, from the *Persian*; and calumet, canoe, maize, potato, tobacco, wigwam, from the *North American Aborigines*. Reference, without aspiring to universal origin, it may be seen, is made to two dozen languages by our American Lexicographer.

The influence of a language that is preeminently copious, necessarily becomes extensively apparent to the world. It is a supersusceptible language capable of unfolding the most variable ideas, and of molding the understanding in the greatest variety of forms. The fabric of such a language, looms above the others around it; and becomes supremely conspicuous in phase and effulgent character. The elements and attachments of the various sciences, find the most suitable riches within its structure: and, possessing the most capacious sphere of mind, it becomes the resort for the exercise of profound and versatile learning. Its superlative copiousness, distinctively its own, enables it to illustrate the most narrowly discriminating ideas with the precision exact truth requires: while all the colors, shades and tints of thought can be displayed by its many apposite and variously adapted words. The narrow line of an intricate current of labyrinthian actions, can be traced with words exactly adapted to descriptions; and every minute object, deed and motive, may meet its precise designation, accurate expression, and clear comprehension. Diversities of occasion and condition, are suited with corresponding variations in expression; and such terms as are not too high nor too low, too strong nor too weak—and such as are obvious and not vulgar, accurate yet not pedantic, elegant yet not artificial, can be found within the lingual service. A grand field for racy and original literature, is here: genius finds entire correspondence between sentiment and language; the arrows of the mind reach their exact mark; and thought has its unmistaken Daguerreotype. We discover no inadequacy of language to atttend and convey emotion; and "no quailing under a powerful conception." Such a language enures to the country having the most extensive Commerce.

The history of the American language, (so we may call the language wnich we use,) if traced with that minuteness necessary to its clear and elaborate presentation, would doubtless exhibit plainly the direct effects of our own Commerce in variegating and enlarging its domain. So, also, reference to the "mother tongue," and its history, will exhibit the potent effects of Great Britain's Commerce on its language—which, in its progress, nourished by commercial influences, speaks entertainingly and instructively;

making it appear—as it has been and still is—a highly influential language on the Globe. Spreading over the British Islands and pushing out several varieties of Celtic. It was subsequently conducted to the American Continent and islands, where it became the leading form of speech, everywhere overwhelming the native and transplanted tongues. "By similar processes of colonization, it has been planted in the great Asiatic Peninsula, (India,) and its islands in Australia, Van Dieman's Land, New Zealand, the southern extremity, and various parts of the western coast of Africa, besides other possessions of Britain in different parts of the world." "We Britons," says Harris, "in our time have been remarkable borrowers, as our *multiform* language may sufficiently show. Our terms in *polite literature* prove that this came from *Greece;* our terms in *music* and *painting*, that these came from *Italy;* our phrases in *cookery* and *war*, that we learnt these from the *French;* and our phrases in *Navigation* that we were taught by the *Flemings* and *Low Dutch*. These many and very different sources of our language may be the cause why it so different in *regularity* and *analogy*.—Yet we have this advantage to compensate the defect, that what we want in *elegance* we gain in *copiousness*, in which last respect few languages will be found superior to our own."

In a retrospective view we will discover similar evidences flowing from the experience of other commercial nations. Israel after their establishment in Canaan, and under the administration of Samuel, and also during the reigns of David and Solomon, we learn, were greatly exalted above other nations. Under David we discover them to have been great and wealthy; and under Solomon eminently conspicuous in the arts and sciences. In the time of the latter, distinguished and learned foreigners resorted to Jerusalem, and the number of strangers was large in the land of Israel. Solomon himself excelled all his cotemporaries in philosophical disquisitions and poetical compositions. He was familiar with elegant architecture, sculpture, music, gardening and agriculture. His temple was a monument of his genius and taste, and of the improvement and grandeur to which the arts attained. He built a number of cities, engaged extensively in commerce, and became preeminent in riches and wisdom.—[*I Kings*, ix: 10.] The history of his reign, as recorded in the sacred writings, makes it evident that society had reached a commanding state of civilization; and the people had become an object of attention to other nations and the model which they imitated. Their language was correspondingly influential. "Those," says a popular writer, "who settled near the sea-shore, and were compelled into commerce and intercourse with strangers, gave to Greece her marvellous accomplishments in arts and letters—the flowers of the ancient world."

"The Grecian commonwealth, while they maintained their liberty, were the most heroic confederacy that ever existed. They were

the politest, the bravest, and the wisest of men. In the short space of little more than a century, they became such statesmen, wariors, orators, historians, physicians, poets, critics, painters, sculptors, architects, and (last of all) philosophers, that one can hardly help considering that GOLDEN PERIOD as a providential event in honor of human nature, to show to what perfection the species might ascend. NOW THE LANGUAGE of these Greeks, was truly like themselves; 'twas conformable to their transcendent and universal genius. Where matter so abounded, words followed of course, and those exquisite in every kind as the ideas for which they stood. And hence, it followed, there was not a subject to be found which could not, with propriety, be expressed in *Greek.*"

Rome too, the "Imperial Mistress of the World," occupied a lofty position in respect to copious and influential language, the evidences of which are, at this remote period, very apparent and convincing. It was truly "*omnis doctrinæ ac scientias thesaurus altissimus.*" The Roman tongue is still used in every branch and department of profound intellectual information; for in it were imbibed all the elements and requisites of elevated and thorough learning in art and science. Originally a dialect of the Greek, afterwards corrupted and mingled with other languages, it gradually rolled onward through the regions of mind till it became an energetic, concise and flowing language, comprising a flood of learning by which for centuries the literary world has been enlightened. Eagle like it reached the loftiest regions of light; and it has continued for centuries to illuminate many institutions of elevated learning in various countries. The English language, with our own and others, continues to possess very many of its ingredient features. It prevails extensively here among medical and legal terms; and gives mottoes to our States and Union. With munition and vigor, never surpassed, this language has entrenched itself in the durable essence of unchangeable wisdom; while time, with its ceaseless revulsions and changes, urges by it with singularly slight ravages. It is doubtless well for the durability and purity of the record that it has, like the Hebrew and Greek, so long ceased to be a familiar tongue. This language was, by slow and almost imperceptible degrees, deteriorated and finally lost, as a spoken language, by the overthrow of the empire and the subjugation of Italy to the Northern Barbarians. It, however, continued for a long period to be spoken with considerable correctness; and was in fact for several centuries the reigning language in the Republic of Letters. "It is of itself one of the finest models of language in all antiquity. It has exerted more influence over the intellect, moral character and destiny of Europe, for twenty centuries, than any other language."

Commercial enterprises, with their direct and indirect influences, will undoubtedly prevail in the future upon the language of Confederated America in degrees commensurate with their extent.

While our Republic is advancing to the pinnacle of its grandeur, a language will be forming which will be, as a necessary consequence, distinctly and peculiarly its own. This will be, it is reasonable to presume, a prominent feature among its other characteristics; and meriting the title to which our nationality directs. "The name of *American*" says Washington in his Farewell Address, "which belongs to you in your national capacity, must always exalt the just pride of patriotism more than any appellation derived from local discriminations." Our language presents evidences of progressively distinctive and capacious features, enlivened by the influences of liberty, and delineating the novel circumstances of the nation. We have left the beaten path of the monarchist; and, in regions thousands of miles off, are forming and maturing a concentrated and energetic language for the use of ourselves as a people, whose position, as a nation, seems destined to be preeminent; and whose language promises for the Future, what Rome's has done for the Past. Powerful efforts are facilitating uniformity in language, making our Republic more continuously conspicuous in this respect without enactments directing it, than other Governments have been with them. Frequent, easy, free and speedy communications and active business intercourses favor this uniformity; while animated progress in the universal educational principle, under the inspiring genius of our matchless institutions, is tending to the same result.

Difference between the language of America and the standard of Great Britain assume a progressive aspect. Similarity seems to be in a condition of secession. The variable commercial influences, a wide variation in government, manners and habits, and other causes evidently make these differences. Whenever men, having one language, separate into different societies, under different governments, innumerable variations readily spring up to diversify the language, and effect distinctive vernaculars. The growing distinctions between the American language and that of Great Britain are clearly discerned upon a superficial view, in the written languages; and may be very readily attributed, in part, to distinctive features in national character. The British are less ready, active and quick than the Americans. (*They* style these features restlessness.) Our military and naval contests with the British and various rival expeditions, inventions and enterprises, all evince a predominant readiness, activity and energetic quickness on the part of the Americans; and they may be distinctly discerned in our language. In commercial correspondence the Americans are conspicuous for their abbreviated and sententious language and rapid terseness; and among our people generally, the taste for concise expression and a desire to abandon unnecessary circumlocution, are observable. Of the improvements which have been shown in the "mother tongue," the most popular and numerous are those which promote analogical uniformity and afford celerity and brevity to the language. We leave the monarchist

with his extended and circuitous orthography to express arithmetic, atlantic, cubic, music, &c., each with a final *k*, (as arithmetick, &c.): ax with a final *e*; hight and highth each with an *e*, (as height &c.): mold, molt, color, harbor, honor, odor, vigor, rigor, &c., each with a *u*, (as mould, colour, &c.); appareled, canceled, counselor, traveler, with two *l's*: plow with *u-g-h* instead of *w*; while we drop or exchange these letters, or substitute one in the place of several; and thus in many other words, as in these, unnecessary and merely cumbrous letters are omitted or remedied—in all of which is evinced an American distinctive feature. We love quickness.

Aware that some words are evidently governed in their original orthography by sound and expression, illustrating the idea or ideas to be conveyed (as, for instance, *p-h—t-h—i-s—i-c*;) interference with such would have been injudicious. Many words, however, in former ordinary use, had no similar pleas for circuitous orthography, yet possessed such palpably mute or dead letters as to render the application of the pruning knife—in clipping them of their superfluities—highly advantageous.

Our Lexicographer has exercised the privilege discreetly: and a similar use on exotic or imported words, from time to time, would probably prove of equal discretion and service. For instance, no good reason interposes against dropping the dead *t* in the words *depot*, (depo,) *entrepot*, *eclat*, *haricot*, introduced from the *French*, and now in full American use.

Besides the differences in the written language and orthography already alluded to, prominent differences in orthoepy also prevail —and are preferred and adopted here against English usage: while our colloquial language, with that of elaborate discourse, is suited to the usance of a less phlegmatic and more active, ready and energetic people than those of England.

Advancing commercial influences, remote intercourses, extended enterprises, continued immigration, progressing invention and science, will, doubtless, all be fruitful in their effects upon our country's future language. Like other living languages, ours must be progressive. "The growth of language cannot be repressed any more than the genial activity of the human soul." Especially in our own country is this so—in "this wilderness of free minds," where new thoughts and commercial results are constantly awakening new and novel modes of expression. Forthcoming contributions, in their gradual course, will evidently flood the vocabulary and break through the restraints of earlier and more limited circumstances; and a new and more extensive regulation will appear to correspond with the widened domain of the "Empire's vernacular." Wherever the star spangled banner waves, over sea and land, the American language will be spoken, and the "mind's eye" of America will be observant—many words and phrases will be coined and used here to which the languages of the Old World will

not apply. The extent of our enlightened country's influence will reach every field of intellect; and our distinctive language will be entrenched in the minds of the nation throughout the length and breadth of the land. Picturesque America will have her poets, orators, authors, artists and philosophers. She will be no longer considered as "a province of England in the matters of art and science." Original and powerful efforts in general literature, philosophy and the fine arts, will beam forth; and a democracy will prove itself, not inimical to intellectual advancement, but favorable to independence of thought and action; and fitting and invigorating to the operations of the mind. Beauties of diction and excellencies of expression, with exquisite combinations of thought, will appear—forming the idiomatic characteristics of our vernacular—and the standard literature of our confederacy. Millions of the rising generation will continue to have our stores of science and erudition before them, which will exhibit a lingual vocabulary, in written and vocal use, not surpassed by any country on the globe. The Eagle of America, borne by the inspiring genius of a lofty nature, kindles "her endazzled eyes at the full mid-day beam" far above where the Lion of the Old World roves; and the more phlegmatic "mother country" may be outstripped in the march of mind, as in that of Commerce, by the more animated sons of Columbia.

No "living language" is ever destitute of a perceptible mutation or gradual adaptation. Such a language is tractable, and in its attachments and formations accommodates itself to the conditions and circumstances of a community. Language varies to suit occupations, improvements and science and arts of life; and differences of climate and classes of objects. Some words become obsolete; some change in signification; and others, that are exotic or new, are introduced into the language. As Commerce, Learning, and the arts and sciences advance in a country and the magnificent phazes of enlightened refinement, genius and invention break forth to the people's gaze—a resort is had to corresponding words, and expressive modes of speech, in unison with the surrounding and influencing circumstances.

Doubts can not dissipate the fact that a silent and irresistible course of rivalry prevails between Great Britain and the United States in regard to a supremacy in the matter of language. Superior commercial powers, activity and wealth, in the one or the other, will enforce decisive influence in the eventual mastery. Unsurpassed energy, rapidity of action, fertility of invention, vigor and scope of mind and enterprise, render it not otherwise than apparent that the lingual powers, with the commercial powers of our Republic, will exert unprecedented influence upon the world. Kept active and concentrated by the electric telegraph, an influential press and general educational institutions, and other channels, within certain limits, we see the illuminating influences of our ver-

nacular piercing and circulating in the wilds of the Continent, subduing the languages of the aborigines and others introduced around them; sweeping away the Spanish and other tongues in the California regions; chosen by the Canadian schools in preference to the vernacular of Great Britain; settling in Africa, and becoming the language of the intelligent descendants of our manumitted slaves; and borne by every American missionary and enterprising expedition among the Heathen, and other countries of the globe: while it is at home entrenching itself in the fundamental truths of every science—and arming and equipping itself with the most inspiring emanations of genius within the intellectual scope of mankind. A. H. R.

Article IV.

ALLIANCE OF CHEMISTRY WITH PHYSIOLOGY.

DIVISION OF FOOD INTO NOURISHMENT, AND MATERIALS FOR COMBUSTION. EFFECTS OF ATMOSPHERIC OXYGEN. BALANCE OF CARBON AND OXYGEN.*

One of the most remarkable effects of the recent progress of science is the alliance of chemistry with physiology, by which a new and unexpected light has been thrown upon the vital processes of plants and animals. We have now no longer any difficulty in understanding the different actions of aliments, poisons and remedial agents—we have a clear conception of the causes of hunger, of the exact nature of death; and we are not, as formerly, obliged to content ourselves with a mere description of their symptoms. It is now ascertained with positive certainty, that all the substances which constitute the food of man must be divided into two great classes, one of which serves for the nutrition and reproduction of the animal body, while the other ministers to quite different purposes. Thus starch, gum, sugar, beer, wine, spirits, &c., furnish no element capable of entering into the composition of blood, muscular fibre, or any part which is the seat of the vital principle. It must surely be universally interesting to trace the great change our views have undergone upon these subjects, as well as to become acquainted with the researches from which our present knowledge is derived.

The primary conditions of the maintenance of animal life, are

* The following article is copied from the "Familiar Letters" of Professor Liebig on chemistry. These letters have been before the public for several years, but as few, except the learned, read such works, we have concluded that his theory respecting the alliance of chemistry with physiology, would be found both interesting and profitable to the general reader. Editors.

a constant supply of certain matters, animal food, and of oxygen, in the shape of atmospheric air. During every moment of life, oxygen is absorbed from the atmosphere in the organs of respiration, and the act of breathing cannot cease while life continues.

The observations of physiologists have demonstrated that the body of an adult man supplied abundantly with food neither increases nor diminishes in weight during twenty-four hours, and yet the quantity of oxygen absorbed into his system, in that period, is very considerable. According to the experiments of Lavoisier, an adult man takes into his system from the atmosphere, in one year, no less than 746 pounds weight of oxygen; the calculations of Menzies make the quantity amount even to 837 pounds; but we find his weight at the end of the year either exactly the same, or differing one way or other by at most a few pounds. What, it may be asked, has become of the enormous amount of oxygen thus introduced into the human system in the course of one year? We can answer this question satisfactorily. No part of the oxygen remains in the body, but is given out again, combined with carbon and hydrogen. The carbon and hydrogen of certain parts of the animal body combine with the oxygen introduced through the lungs and skin, and pass off in the forms of carbonic acid and vapor of water. At every expiration and every moment of life, a certain amount of its elements are separated from the animal organism, having entered into combination with the oxygen of the atmosphere.

In order to obtain a basis for an approximate calculation, we may assume, with Lavoisier and Seguin, that an adult man absorbs into his system 32½ ounces of oxygen daily—that is, 46,037 cubic inches = 15,661 grains, French weight; and further, that the weight of the whole mass of his blood is 24 pounds, of which 80 per cent. is water. Now, from the known composition of the blood, we know that in order to convert its whole amount of carbon and hydrogen into carbonic acid and water 64.102 grains of oxygen are required. This quantity will be taken into the system in four days and five hours. Whether the oxygen enters into combination directly with the elements of the blood, or with the carbon and hydrogen of other parts of the body, it follows inevitably—the weight of the body remaining unchanged and in a normal condition—that as much of these elements as will suffice to supply 24 pounds of blood, must be taken into the system in four days and five hours; and this necessary amount is furnished by the food.

We have not, however, remained satisfied with mere approximation: we have determined accurately, in certain cases, the quantity of carbon taken daily in the food, and of that which passes out of the body in the fæces and urine combined—that is, uncombined with oxygen; and from these investigations it appears that an adult man, taking moderate exercise, consumes 13$\frac{2}{10}$ ounces of carbon, which pass off through the skin and lungs as carbonic acid gas.*

* The account is deduced from observations made upon the average daily con-

It requires 37 ounces of oxygen to convert $13\frac{9}{10}$ of carbon into carbonic acid. Again: according to the analysis of Boussingault (Annales de Chim. et de Phys., lxx. i., p. 136) a horse consumes $79\frac{1}{10}$ ounces of carbon in twenty-four hours, a milch cow $70\frac{3}{4}$ ounces; so that the horse requires 13 pounds $3\frac{1}{2}$ ounces, and the cow 11 pounds $10\frac{3}{4}$ ounces of oxygen†

As no part of the oxygen taken into the system of an animal is given off in any other form than combined with carbon or hydrogen, and as in a normal condition, or state of health, the carbon or hydrogen so given off are replaced by these elements in the food, it is evident the amount of nourishment required by an animal for its support must be in a direct ratio with the oxygen taken into its system. Two animals which in equal times take up by means of the lungs and skin unequal quantities of oxygen, consume an amount of food unequal in the same ratio. The consumption of oxygen in a given time may be expressed by the number of respirations; it is therefore obvious, that in the same animal the quantity of nourishment required must vary with the force and number of respirations. A child breathes quicker than an adult, and consequently requires food more frequently and proportionably in larger quantity, and bears hunger less easily. A bird deprived of food dies on the third day, while a serpent, confined under a bell, respires so slowly that the quantity of carbonic acid generated in an hour can scarcely be observed, and it will live three months, or longer, without food. The number of respirations is fewer in a state of rest than during labor or exercise; the quantity of food necessary in both cases must be in the same ratio. An excess of food, a want of a due amount of respired oxygen, or of exercise, as also great exercise (which obliges us to take an increased supply of food,) together with weak organs of digestion, are incompatible with health.

But the quantity of oxygen received by an animal through the lungs not only depends upon the number of respirations, but also upon the temperature of the respired air. The size of the thorax of an animal is unchangeable; we may therefore regard the volume of air which enters at every inspiration as uniform. But its weight, and consequently the amount of oxygen it contains, is not constant. Air is expanded by heat, and contracted by cold—an equal volume of hot and cold air contains, therefore, an unequal amount

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sumption of about 30 soldiers in barracks. The food of these men, consisting of meat, bread, potatoes, lentils, peas, beans, butter, salt, pepper, &c., was accurately weighed during a month, and each article subjected to ultimate analysis. Of the quantity of food, beer, and spirits, taken by the men when out of barracks, we have a close approximation from the report of the sergeant: and from the weight and analysis of the faces and urine, it appears that the carbon which passes off through these channels may be considered equivalent to the amount taken in that portion of the food, and of sour-crout, which was not included in the estimate.

† 16 ounces = ½ kilogramme.

of oxygen. In summer, atmospheric air contains water in the form of vapor; it is nearly deprived of it in winter. The volume of oxygen in the same volume of air is smaller in summer than in winter. In summer and winter, at the pole and at the equator, we inspire an equal volume of air; the cold air is warmed during respiration and acquires the temperature of the body. In order, therefore, to introduce into the lungs a given quantity of oxygen, less expenditure of force is necessary in winter than in summer, and for the same expenditure of force more oxygen is inspired in winter. It is also obvious that in an equal number of respirations we consume more oxygen at the level of the sea than on a mountain.

The oxygen taken into the system is given out again in the same form, both in summer and winter; we expire more carbon at a low than a high temperature, and require more or less carbon in our food in the same proportion; and consequently more is respired in Sweden than in Sicily, and in our own country an eigth more in winter than in summer. Even if an equal weight of food is consumed in hot and cold climates, Infinite Wisdom has ordained that very unequal proportions of carbon shall be taken in it. The food prepared for the inhabitants of southern climes does not contain in a fresh state more than 12 per cent. of carbon, while the blubber and train oil which feed the inhabitants of polar regions contain 66 to 80 per cent. of that element.

From the same cause it is comparatively easy to be temperate in warm climates, or to bear hunger for a long time under the equator; but cold and hunger united very soon produce exhaustion.

The oxygen of the atmosphere received into the blood in the lungs, and circulated throughout every part ef the animal body, acting upon the elements of the food, is the source of *animal heat.*

ANIMAL HEAT, ITS LAWS AND INFLUENCE ON THE ANIMAL FUNCTIONS. LOSS AND SUPPLY. INFLUENCE OF CLIMATE. FUEL OF ANIMAL HEAT. AGENCY OF OXYGEN IN DISEASE. RESPIRATION.

The source of animal heat, its laws, and the influence it exerts upon the functions of the animal body, constitute a curious and highly interesting subject, to which I would now direct your attention.

All living creatures, whose existence depends upon the absorbtion of oxygen, possess within themselves a source of heat, independent of surrounding objects.

This general truth applies to all animals, and extends to the seed of plants in the act of germination, to flower-buds when developing, and fruits during their maturation.

In the animal body, heat is produced only in those parts to which arterial blood, and with it the oxygen absorbed in respiration, is

conveyed. Hair, wool, and feathers, receive no arterial blood, and therefore in them no heat is developed. The combination of a combustible substance with oxygen is, under all circumstances, the only source of animal heat. In whatever way carbon may combine with oxygen, the act of combination is accompanied by the disengagement of heat. It is indifferent whether this combination takes place rapidly or slowly, at a high or at a low temperature; the amount of heat liberated is a constant quantity.

The carbon of the food being converted into carbonic acid within the body, must give out exactly as much heat as if it had been directly burnt in oxygen gas or in common air; the only difference is, the production of the heat is diffused over unequal times. In oxygen gas the combustion of carbon is rapid, and the heat intense; in atmospheric air it burns slower and for a longer time, the temperature being lower; in the animal body the combination is still more gradual, and the heat is lower in proportion.

It is obvious that the amount of heat liberated must increase or diminish with the quantity of the oxygen introduced in equal times by respiration. Those animals therefore which respire frequently, and consequently consume much oxygen, possess a higher temperature than others, which, with a body of equal size to be heated, take into the system less oxygen. The temperature of a child (102°) is higher than that of an adult (99.5°.) That of birds (104° to 105.4°) is higher than that of quadrupeds (98.5° to 100.4°) or than that of fishes or amphibia, whose proper temperature is from 2.7° to 3.6° higher than that of the medium in which they live. All animals, strictly speaking, are warm-blooded; but in those only which possess lungs is the temperature of the body quite independent of the surrounding medium.

The most trustworthy observations prove that in all climates, in the temperate zones, as well as at the equator or the poles, the temperature of the body in man, and in what are commonly called warm-blooded animals, is invariably the same; yet how different are the circumstances under which they live!

The animal body is a heated mass, which bears the same relation to surrounding objects as any other heated mass. It receives heat when the surrounding objects are hotter, it loses heat when they are colder than itself.

We know that the rapidity of cooling increases with the difference between the temperature of the heated body and that of the surrounding medium; that is, the colder the surrounding medium the shorter the time required for the cooling of the heated body.

How unequal, then, must be the loss of heat in a man at Palermo, where the external temperature is nearly equal to that of the body, and in the polar regions where the external temperature is from 70 to 90 degrees lower!

Yet, notwithstanding this extremely unequal loss of heat, experience has shown, that the blood of the inhabitants of the arctic

circle has a temperature as high as that of the native of the south, who lives in so different a medium.

This fact, when its true significance is perceived, proves that the heat given off to the surrounding medium is restored within the body with great rapidity. This compensation must consequently take place more rapidly in winter than in summer, at the pole than at the equator.

Now, in different climates the quantity of oxygen introduced into the system by respiration, as has been already shown, varies according to the temperature of the external air; the quantity of inspired oxygen increases with the loss of heat by external cooling, and the quantity of carbon or hydrogen necessary to combine with this oxygen must be increased in the same ratio.

It is evident that the supply of the heat lost by cooling is effected by the mutual action of the elements of the food and the inspired oxygen, which combine together. To make use of a familiar, but not on that account less just illustration, the animal body acts, in this respect, as a furnace, which we supply with fuel. It signifies nothing what intermediate forms food may assume, what changes it may undergo in the body, the last change is uniformly the conversion of its carbon into carbonic acid, and of its hydrogen into water. The unassimilated nitrogen of the food, along with the unburned or unoxidized carbon, is expelled in the urine or in the solid excrements. In order to keep up in the furnace a constant temperature, we must vary the supply of fuel according to the external temperature, that is, according to the supply of oxygen.

In the animal body the food is the fuel; with a proper supply of oxygen we obtain the heat given out during its oxidation or combustion. In winter, when we take exercise in a cold atmosphere, and when consequently the amount of inspired oxygen increases, the necessity for food containing carbon and hydrogen increases in the same ratio; and by gratifying the appetite thus excited, we obtain the most efficient protection against the most piercing cold. A starving man is soon frozen to death. The animals of prey in the arctic regions, as every one knows, far exceed in voracity those of the torrid zone.

In cold and temperate climates, the air, which incessantly strives to consume the body, urges man to laborious efforts in order to furnish the means of resistance to its action, while, in hot climates, the necessity of labor to provide food is far less urgent.

Our clothing is merely an equivalent for a certain amount of food. The more warmly we are clothed the less urgent becomes the appetite for food, because the loss of heat by cooling, and consequently the amount of heat to be supplied by the food, is diminished.

If we were to go naked, like certain savage tribes, or if in hunting or fishing we were exposed to the same degree of cold as the

L. of C.

Samoyedes, we should be able with ease to consume 10 pounds of flesh, and perhaps a dozen of tallow candles into the bargain, daily, as warmly clad travellers have related with astonishment of these people. We should then also be able to take the same quantity of brandy or train oil without bad effects, because the carbon and hydrogen of these substances would only suffice to keep up the equilibrium between the external temperature and that of our bodies.

According to the preceding expositions, the quantity of food is regulated by the number of respirations, by the temperature of the air, and by the amount of heat given off to the surrounding medium.

No isolated fact, apparently opposed to this statement, can affect the truth of this natural law. Without temporary or permanent injury to health, the Neapolitan can not take more carbon and hydrogen in the shape of food than he expires as carbonic acid and water; and the Esquimaux can not expire more carbon and hydrogen than he takes into the system as food, unless in a state of disease or of starvation. Let us examine these states a little more closely.

The Englishman in Jamaica perceives with regret the disappearance of his appetite, previously a source of frequently returning enjoyment; and he succeeds by the use of cayenne pepper and the most powerful stimulants in enabling himself to take as much food as he was accustomed to eat at home. But the whole of the carbon thus introduced into the system is not consumed; the temperature of the air is too high, and the oppressive heat does not allow him to increase the number of respirations by active exercise, and thus to proportion the waste to the amount of food taken; disease of some kind, therefore, ensues.

On the other hand, England sends her sick to southern regions, where the amount of the oxygen inspired is diminished in a very large proportion. Those whose diseased digestive organs have in a greater or less degree lost the power of bringing the food into the state best adapted for circulation, and therefore are less able to resist the oxidizing influence of the atmosphere of their native climate, obtain a great improvement in health. The diseased organs of digestion have power to place the diminished amount of food in equilibrium with the inspired oxygen, in the mild cltmate; while in a colder region the organs of respiration themselves would have been consumed in furnishing the necessary resistance to the action of the atmospheric oxygen.

In our climate, hepatic diseases, or those arising from excess of carbon, prevail in summer; in winter, pulmonary diseases, or those arising from excess of oxygen, are more frequent.

The cooling of the body, by whatever cause it may be produced, increases the amount of food necessary. The mere exposure to the open air, in a carriage or on the deck of a ship, by increasing radiation and vaporization, increases the loss of heat, and compels

us to eat more than usual. The same is true of those who are accustomed to drink large quantities of cold water, which is given off at the temperature of the body, 98.5 degrees. It increases the appetite, and persons of weak constitution find it necessary, by continued exercise, to supply to the system the oxygen required to restore the heat abstracted by the cold water. Loud and long continued speaking, the crying of infants, moist air, all exert a decided and appreciable influence on the amount of food which is taken.

We have assumed that it is especially carbon and hydrogen which, by combining with oxygen, serve to produce animal heat. In fact, observation proves that the hydrogen of the food plays a not less important part than the carbon.

The whole process of respiration appears most clearly developed, when we consider the state of a man, or other animal, totally deprived of food.

The first effect of starvation is the disappearance of fat, and this fat can not be traced either in the urine or in the scanty fæces. Its carbon and hydrogen have been given off through the skin and lungs in the form of oxidized products; it is obvious that they have served to support respiration.

In the case of a starving man, $32\frac{1}{3}$ oz. of oxygen enter the system daily, and are given out again in combination with a part of his body. Currie mentions the case of an individual who was unable to swallow, and whose body lost 100 lbs. in weight during a month; and, according to Martell (Trans. Linn. Soc. vol. xi, p. 411,) a fat pig, overwhelmed in a slip of earth, lived 160 days without food, and was found to have diminished in weight, in that time, more than 120 lbs. The whole history of hybernating animals, and the well-established facts of the periodical accumulation, in various animals, of fat, which, at other periods, entirely disappears, prove that the oxygen, in the respiratory process, consumes, without exception, all such substances as are capable of entering into combination with it. It combines with whatever is presented to it; and the deficiency of hydrogen is the only reason why carbonic acid is the chief product; for, at the temperature of the body, the affinity of hydrogen for oxygen far surpasses that of carbon for the same element.

We know, in fact, that the graminivora expire a volume of carbonic acid equal to that of the oxygen inspired, while the carnivora, the only class of animals whose food contains fat, inspire more oxygen than is equal in volume to the carbonic acid expired. Exact experiments have shown, that in many cases only half the volume of oxygen is expired in the form of carbonic acid. These observations cannot be gainsaid, and are far more convincing than those arbitrary and artificially produced phenomena, sometimes called experiments; experiments which, made as too often they are, without regard to the necessary and natural conditions, pos-

sess no value, and may be entirely dispensed with; especially when, as in the present case, nature affords the opportunity for observation, and when we make a rational use of that oportunity.

In the progress of starvation, however, it is not only the fat which disappears, but also, by degress, all such of the solids as are capable of being dissolved. In the wasted bodies of those who have suffered starvation, the muscles are shrunk and unnaturally soft, and have lost their contractility; all those parts of the body which were capable of entering into the state of motion have served to protect the remainder of the frame from the destructive influence of the atmosphere. Toward the end, the particles of the brain begin to undergo the process of oxidation, and delirium, mania, and death close the scene; that is to say, all resistance to the oxidizing power of the atmospheric oxygen ceases, and the chemical process of eremacausis, or decay, commences, in which every part of the body, the bones excepted, enters into combination with oxygen.

The time which is required to cause death by starvation depends on the amount of fat in the body, on the degree of exercise, as in labor, or exertion of any kind, on the temperature of the air, and finally on the presence or absence of water. Through the skin and lungs there escapes a certain quantity of water, and as the presence of water is essential to the continuance of the vital motions, its dissipation hastens death. Cases have occurred, in which a full supply of water being accessible to the sufferer, death has not occurred till after the lapse of twenty days. In one case, life was sustained in this way for the period of sixty days.

In all chronic diseases death is produced by the same cause, namely, the chemical action of the atmosphere. When those substances are wanting, whose function in the organism is to support the process of respiration; when the diseased organs are incapable of performing their proper function of producing these substances; when they have lost the power of transforming the food into that shape in which it may, by entering into combination with the oxygen of the air, protect the system from its influence, then, the substance of the organs themselves, the fat of the body, the substance of the muscles, the nerves, and the brain, are unavoidably consumed. The true cause of death in these cases is the respiratory process, that is, the action of the atmosphere.

A deficiency of food, and a want of power to convert the food into a part of the organism, are both, equally, a want of resistance; and this is the negative cause of the cessation of the vital process. The flame is extinguished, because the oil is consumed; and it is the oxygen of the air which has consumed it.

In many diseases substances are produced which are incapable of assimilation. By the mere deprivation of food, these substances are removed from the body without leaving a trace behind; their elements have entered into combination with the oxygen of the air.

From the first moment that the function of the lungs or of the skin is interrupted or disturbed, compounds, rich in carbon, appear in the urine. which acquires a brown color. Over the whole surface of the body oxygen is absorbed, and combines with all the substances which offer no resistance to it. In those parts of the body where the access of oxygen is impeded; for example, in the arm-pits, or in the soles of the feet, peculiar compounds are given out, recognizable by their appearance, or by their odor. These compounds contain much carbon.

Respiration is the falling weight—the bent spring, which keeps the clock in motion; the inspirations and expirations are the strokes of the pendulum which regulate it. In our ordinary timepieces, we know with mathematical accuracy the effect produced on their rate of going, by changes in the length of the pendulum, or in the external temperature. Few, however, have a clear conception of the influence of air and temperature on the health of the human body; and yet the research into the conditions necessary to keep it in the normal state, is not more difficult than in the case of a clock.

ARTICLE V.

TOWNS AND STATISTICS OF MINNESOTA.

To those accustomed to the Northern winters, there is perhaps no part of the continent possessing greater attractions than Minnesota; nor have we known a people who seemed so much delighted with their country, or more hopeful of its future prosperity than those residing in the vicinity of the Falls of St. Anthony.

Saint Paul, a city of some three summers' growth, exhibits social developments which distinguish its citizens from those of every other town we have known in a newly settled country. Amongst their social and literary institutions they can already boast of a historical society whose annals for the year 1850 fill about one hundred and eighty pages.

We have taken a peculiar interest in the settlement of that great region including the sources of the Mississippi and the Red River of the North; and it affords us much pleasure to note the high degree of intelligence, and the individual and social enterprise which distinguish the pioneers of that favored land. Pioneers they are, but how unlike those of the last generation. We delight to recur to the history of the early pioneers of the West; and, in our imagination, we

have traced out many descendants of Nimrod, Hercules, and Jason, who might well claim a niche in the temple of Fame, not less conspicuous than that occupied by their fabled ancestors. It may be truly said: "in those days there were giants in the land:" but, having accomplished the purposes for which they were designed in the advancement of civilization, they have passed away; and, "take them all in all, we shall never look upon their like again." Of these, few, only, found a place in their country's history: yet, tradition and romance shall rescue many noble deeds and humble names from oblivion which have been coldly neglected by the historian.

But as much as we admire the character of the early pioneers, we rejoice that civilization has advanced beyond that state which requires the existence and services of such a race of men. We know they no longor exist, as a distinctive class; but yet, when we look to Wisconsin, Iowa, and especially to Minnesota, we experience a sense of disappointment, and can scarcely realize the fact that the inhabitants of countries so recently occupied by savage tribes, are in the full enjoyment of all the advantages and refinements of civilization.

This advanced state of society in the vicinity of the Falls is not without a meaning. We regard that place as destined to become the resort of a greater number of such as travel for health and amusement, than any other point east of the Rocky mountains; and the intelligence and refinement of the first settlers will not only add to the natural attractions of that particular neighborhood, but give tone and character to the social institutions of the entire country.

The following description of the principal towns of Minnesota is from the "Annals of the Minnesota Historical Society."

EDITOR.

SAINT PAUL.

THE HEAD OF NAVIGATION ON THE UPPER MISSISSIPPI.

LATITUDE 44° 52′ 46″—LONGITUDE 93° 4′ 54″.

This town is a port of entry, the county seat, and the seat of government of the Territory of Minnesota. Also, pleasantly situated on the east bank of the Mississippi river, eight miles from the Falls of St. Anthony, and five miles from Fort Snelling; about 2070 miles from the mouth of the Missippi river, and near its confluence with the St. Peters river, and is elevated about 800 feet above the Gulf of Mexico. It is near the geographical centre of the continent of North America, in the North Temperate Zone, and must eventually become a central nucleus for the business of one of the best watered, timbered, and most fertile and healthy

countries on the globe. It is surrounded in the rear by a semicircular plateau, elevated about forty feet above the town, of easy grade, and commanding a magnificent view of the river above and below. Nature never planned a spot better adapted to build up a showy and delightful display of architecture and gardening, than that natural terrace of hills. During the past year it "has sprung up, like Minerva, full armed, from the head of Jupiter;" and now contains four churches, several large hotels, two steam saw mills, in operation, a large number of stores, two daguerreotypists, with many other branches of industry—and fifteen hundred inhabitants. Last, not least, three weekly newspapers, and one monthly, printed in the Sioux and English languages; the whole forming an instance of Western enterprise and determined energy and resolution hitherto unsurpassed in the history of any frontier settlement.

Whatever direction we take among the localities of Minnesota, we find subjects of interest, whether in awaking the spirits of the dusky past, or alighting upon the improvements of our own times. There is scarcely a section of the world newer than this: and, we may add, there is no section which has started upon the horizon of civilized life more suddenly.

From the lower landing of St. Paul, we rise upon a bench some seventy-five feet above the river, and come upon the site of the lower town, which—with the extension up the river as far as the upper landing, a distance of three-fourths of a mile, where is a most vigorous young town of later growth—completes St. Paul, the capital of Minnesota. Retiring from the lower town, about half a mile northerly, across a plain which appears to have once been the basin of a lake, for it is nearly walled in by a bluff fifteen feet high, we suddenly rise upon a third bluff nearly two hundred feet high, and some three hundred feet above the Mississippi.—This ascent is wooded, and so is the region beyond, for perhaps twenty miles. From this point we overlook St. Paul; extending the vision down the river some twenty miles, taking within the compass of the eye a wide stretch of the Sioux lands and bluish hills far away up the St. Peters, in the west.

To the north, though the grounds descend from the bluff, for some three miles, there are but few objects of distinct outline. After viewing a small lake, lying about a mile to the north-west, as a setting to a border of oak openings, we proceed through a constantly alternating succession of oak-covered knolls, marshy dells, and around the margins of small tamarack swamps. These swamps, though dismal, for their size, are the most curious objects to the eye of the stranger, which this region presents. The trees grow so thick that they choke each other out of the chance for a subsistance, or else they die a natural death after a certain age, so that they resemble a scene of shipping in a seaport most strikingly. It is easy, when in a dreamy mood of mind, to fancy these bare

poles as the masts of some diluvian squadrons, which had lost their reckoning, and finally getting discouraged, moored in the mud.

There are no guide-boards on this road, and the angler or sportsman—who can't *parler français* with the French residents, whose cabins nestle in some of the sly retreats along the path—may thank the stars if he does not get lost over night.

The region is spotted all over, at distances of one to three miles, with bright and cool little lakes, that abound in fish; among which is the real White Mountain trout.

Having had personal observation no farther out in this direction than some four miles, we must take a tack in our description, merely adding that there is a settlement, two miles beyond our discoveries, called Little Canada, composed of French; that, sixteen miles from St. Paul, is a lake famous for fish, and somwhere else in that vicinity are the extensive cranberry meadows, temporarily occupied by the Sioux Indians, who have already sent into St. Paul 4000 bushels of cranberries this season, (1850.)

The scene over the bluff in the rear of the upper town of St. Paul, is the delightful prairie, which extends off about six miles towards St. Anthony Falls.

The true quality of the soil of the comparatively chaotic lands in the rear of St. Paul, is, after all, better than that of the lands of Western New York. It has less of the black alluvion than our lands generally, yet it is highly productive; and so far as experience has tested its capabilities, it does not depreciate at all by cropping. It is strongly impregnated with lime, and possesses in a high degree the active principle imparted by a variety of mineral substances.

This soil can be made, by the application of manure, of which an abundance can be had for the trouble of carting from town, more productive than the best river bottoms. For the purpose of gardening, we are inclined to prefer it to the latter; and if we were to make a claim, we would "take up" the lands we could find unoccupied, nearest the town.

The lower part of the town was laid out 26th Feb. 1849, by Louis Roberts, Henry Jackson, David Lambert, Benjamin W. Brunson, Chas. Cavileer, Henry H. Sibley, J. W. Bass, Augustus L. Larpenteur, W. H. Forbes, J. W. Simpson, Vital Guerin, and others. That portion of the town which is known as the "Upper Town," was laid out by Henry M. Rice and John R. Irvine, in January, 1849; and a further addition to said town was made in the summer of 1849, by Samuel Leech, C. K. Smith, W. H. Forbes, James McC. Boal, Louis Roberts, Alexander Wilkin, H. W. Tracy, Jr C. Ramsey. This addition is called "Leech's Addition." In it there are nine blocks, fourteen lots in each block. —The streets and lots occupy forty acres of land; and lastly, the addition of Whitney and Smith, was laid out also in the spring of 1849, and is situated in the lower part of the town.

The legislature has authorized the location of the capitol buildings of the Territory at this point. The commissioners of the public buildings will be elected this spring, and the erection of the capitol will be given out and the work commenced soon.

We have many branches of business carried on here already. We give a meagre and very imperfect list of some of our business men, as follows:

STATISTICS.

EDITORS AND PUBLISHERS.

James M. Goodhue, Minnesota Pioneer.
Charles J. Henniss, Minnesota Chronicle and Register.
D. A. Robertson, Minnesota Democrat.
G. H. Pond, Dakota Friend.
J. W. Chaskarak, Watab Reveille.

Hotels and boarding houses, 6. Lawyers, 18. Physicians, 6. Druggists, 4. Merchants, 20. Carpenters, 8. Saddlers, 2. Shoemakers, 1. Painters, 4. Tailors, 5. Watchmakers, 1. Bakers, 2. Tinners and Stove Dealers, 2. Insurance companies, 4. Livery Stables, 2. Saloons and Coffee Houses, 10. Blacksmiths, 2.

ASSOCIATIONS.—Free and accepted Masons, 1. Odd Fellows, 1. Sons of Temperance, 1.

Three Churches, viz: a Methodist, Baptist, and Presbyterian, have been organized in St. Paul.

SAINT ANTHONY.

Saint Anthony City is situated near to and below the Falls of St. Anthony. W. A. Cheever is the proprietor, and it was laid out 3d January, 1848, and consists of 182 lots. The Falls, including the rapids, make a total descent of sixty-four feet and ten inches.

Franklin Steele, Esq., laid out a plot in 1849, opposite the Falls, which consists of 56 blocks of lots; in each block there are ten lots.—The town is called St. Anthony.

P. Butcheneau in 1849, laid out an addition to St. Anthony, consisting of twenty-three blocks of lots, each block containing fourteen lots.

I. Atwater, Esq., of St. Anthony Falls, writes as follows:

SIR:—Your esteemed favor of the 19th January last informing me of my election as a member of the Minnesota Historical Socie-

ty, has been received. Taking a deep interest in the objects which the Society has in view, I embrace the opportunity to contribute my mite to the general stock, by giving you a few items in regard to the location and early history of the village of St. Anthony.

The direction of the Mississippi at this place, and for several miles above, is nearly south. Opposite the village, three islands, lying nearly in a straight line, one above the other, divide the river into two parts—the largest body of water flowing on the right hand of the islands. The upper island is small, containing less than ten acres of land, and is yet unsurveyed. It is still uncultivated, though the trees with which it was but a short time since densely covered, are fast disappearing, and it will soon be brought under tribute to the husbandman.

The second island is some eight or ten rods below, and contains about forty acres. It is a beautiful spot of ground, covered thickly with a great variety of thrifty timber, among which the sugar maple is conspicuous. The banks are high, bold, and rocky, on the upper end, gradually descending at the lower, almost to the water's edge. Near the middle of the island, a small bluff rises, some ten or fifteen feet high, with a slope as nicely and beautifully turned as if it had been the work of art. It forms a semicircular curve at the lower end, gradually widening towards the upper, making one of the most charming building sites that can be imagined. Near the lower end of this island commence the rapids in the main stream, the water foaming and dashing over the rocks, which lie scattered across the bed of the stream, as far as the falls.

Franklin Steele, Esq., owns this island, having entered it in 1848, as soon as it was surveyed. It is considered valuable property, the proprietor, as is reported, having been offered four thousand dollars for one half of it.

The third island lies immediately below, so near the last mentioned that they were formerly connected by a slight bridge. It contains, on a rough estimate, some fifteen acres, and is not yet surveyed. A small house has been erected upon it by the Mill Company, as a pre-emption claim. On each side of this island are the Falls of St. Anthony. Below the falls are two small islands, near the right shore. The falls of the main channel are several rods above those on this side, the greater volume of water having worn away the soft crumbling rock much faster.—The recedence of the falls on both sides is so rapid as to be almost yearly perceptible; making the suppositions of some geologists highly plausible, that originally they were as low as Fort Snelling. During the high water of last summer, huge masses of rocks were torn from the islands washed by the falls, and carried a considerable distance down the river; large blocks of sand and limestone detached from the ledge of rock, over which the water is precipitated; and altogether, the falls underwent a greater change than had been observed for many years.

Franklin Steele, Norman W. Kitson, and Mr. Stumbough, made

a claim on lands in this vicinity, as early as '36 or '37, soon after the Indian title was obtained by government. The land, however, was not surveyed and entered till 1848. Charles Wilson seems to have been the first American who ever made a permanent residence here, having arrived in the spring of 1847. There was then but one house in the place, standing on the bluff some thirty rods below the mills, and built of logs. Roving Frenchmen and trappers may have temporarily resided here, previously; but not as permanent settlers. Mrs. Ard Godfrey may claim the honor of having given birth to the first of the fair daughters of St. Anthony; and her husband, A. Godfrey, Esq., that of having commenced the first improvement of the water power at the Falls. Under his superintendence, in the fall of 1847, the dam and saw mills owned by the St. Anthony Mill Company, were begun, and the first saw put in operation in August, 1848. Three others were completed soon after, making four saws now running, of an average capacity of 6000 feet each per day. In the year 1850, there were about nine million feet of lumber in the dam, much of which was lost by the high water in the summer.

R. P. Russell, Esq., erected the first frame dwelling in the town, in 1847 and opened the first store. There are now six stores, and one hotel, opened July 4th, 1850. There are at present three lawyers, three physicians, four clergymen, and the same number of organized churches—Presbyterian, Episcopalian, Methodist and Baptist. The Baptists and Episcopalians have erected, though not completed, houses of worship. Two school districts, known as No. 5 and 6, were organized in the village in the fall of 1850. The former numbers 156 scholars, and the latter 115. In addition to the public schools taught in these districts, several flourishing select schools have been maintained the past year.—The whole population of the place may be safely estimated at one thousand souls.

I should have stated, that before the erection of the dam, which has changed the current to some extent, a horse and wagon has not unfrequently been driven across the main channel, some fifty or sixty rods above the falls. Some investigations are now being made, to ascertain the average annual distance which the falls recede, which may throw further light on this interesting subject.

STILLWATER.

The following letter from John McKussick, gives a very satisfactory account of the first settlement of this village and the surrounding country:

DEAR SIR:—In reply to your enquiry for the facts, dates, &c., as to the early settlements of the Territory now included within the limits of Washington county, I send you items as they occur to me, hoping that a hurried review even, of our short history, may afford you something satisfactory.

The first seettlement of this county was commenced in 1837 at what is called Taylor's Falls—by Baker, Taylor and others of the Northwest Lumber Company. About which time, the Government treaty with the Sioux and Chippewa Indians was concluded for the land, the Sioux owning the southern, and the Chippewas the northern portion of the land in this county. July 17th, 1838, the treaty being ratified by Congress, consequently several settlements were commenced about that time. Several by the French, along the shores of Lake St. Croix, as well as the more important settlements of the Marine and Falls of St. Croix.

The first Steamboat that navigated the river St. Croix, was the Palmyra, July 17th, 1838, having on board the original proprietors of the Marine and Falls of St. Croix Saw Mills, together with their necessary supplies and machinery, for the erection of the mills at those places. The Falls of St. Croix not being within our country, I therefore proceed to notice next the settlement of the Marine Mills, which was commenced in 1838, by Samuel Burkleo, formerly of the State of Delaware, Orange Walker from Vermont, and others of the Marine Lumber Company, who succeeded in erecting a good saw-mill for the manufacture of pine lumber. Other buildings of different kinds have since been built, together with one large and commodious tavern stand. This place is a business point of considerable importance.

At this time, the jurisdiction of Crawford county, Wisconsin Territory, extended over all this Territory, northwest from Prairie du Chien. Joseph R. Brown was chosen Representative to the Legislative Assembly of Wisconsin, to represent the wants of the population, and among the many representations of the wants of the people, was the organization of a new county here, which was granted by the Legislature in 1841, as will be seen by their act, Nov. 20, entitled an act to organize the county of St. Croix. At the time prescribed by law for holding the court, up came the Judge to hold the court at the seat of Justice, and on arriving at Dakota, the seat of Justice, to his great astonishment, the only building in the Town was a rough log cabin, occupied by a lone Frenchman, who, it appears, was employed by the proprietor of the Town to take care of the county seat in his absence. This kind of reception not meeting the expectations of the Judge, he very naturally took back tracks, and thus ended the judicial proceedings for St. Croix county. It was soon after attached to Crawford county, where it remained until 1847, when we were again reorganized for judicial purposes, and the county seat established at Stillwater, where the first U. S. District court was holden, in what is now

Minnesota territory, being the June term of 1848; there being no court house, the court was holden at tne store of John McKussick, by the Hon. Charles Dunn, Judge of said court.

Stillwater—this town was first settled, Oct. 10th, 1843, by John McKussick, formerly from Maine; Elam Greely from Maine; Calvin F. Leach from Vermont, and Elias McKean from Pennsylvania, proprietors of the Stillwater Lumber company; having selected this site on occount of its valuable water power, for the erection of a saw-mill, which was put in operation early in the spring of 1844. The simple board shanties, of the first settlers, together with the mill remained the only buildings in the place until the fall of 1844. when the first frame house was built by A. Northup for a tavern stand.

From this time the place steadily grew in importance. In 1846 a post office was established and Elam Greely appointed postmaster.—In 1848 the town was laid out by John McKussick, one of the proprietors thereof. About this time the county commissioners authorized the building of a court house at this place, which was completed in 1850.—A school house was also built here in 1848, schools having been established as early as 1846 and held in private houses. A Presbyterian church, being the first in the town, has been erected the past year, for which we are indebted to the zeal and perseverance of the Rev. J. C. Whitney, Pastor of the Presbyterian church of this place. The settlement of the Arcole Mills, which ranks next in age, was commenced in 1846, by Martin Mower, W. H. Folsom, formerly from Maine; and Joseph Brewster from New York, who erected a saw-mill at this point. Since which many other buildings have been built, which, together with the mill, give this place the appearance of a thriving little village.

$20,000 will be expended in Stillwater this year for the erection of a Penitentiary for the Territory.

THE ST. CROIX AND THE PINERIES.

The distance from Stillwater to the Falls of St. Croix, is 33 measured miles. The only visible habitations to be seen as you journey on the ice, are the Arcola, the Marine, and the Osceola mills. * * * * * * * * *

St. Croix contains a population of six hundred. The streets are regularly laid out, the buildings are neat and handsomely painted, the citizens are frank and hospitable, but the land is rocky and mountainous, the soil sterile, all having a Yankee appearance.

* * * * * * *

The timber about St. Croix is well *mixed*, the maple being the most abundant; then ash, elm, and the red birch, (which grows to a great hight,) are to be found, with a pretty good supply of white and red oak. The wild red plum trees are common around the prairies, so is the crab apple—and the black and red cherry. There are a few very large black walnuts; but that timber is not plenty. The poplar is quite plenty, adjoining the prairies. From an experiment made by an old back-woodsman, a year or two ago, it was ascertained, that the soil in this neighborhood would produce as good wheat, oats and potatoes, as the most favored parts of Illinois and Wisconsin. Corn has been cultivated with success by the Indian traders.

Pokagomon, six miles from Greely's Station, is somewhat noted as an old missionary station. Here the Rev. Frederick Ayers, Mr. Boutwell and Mr. Ely remained for a long time; Mr. Russell opened a large farm at this point.

A word on the lumbering resources of the St. Croix. This winter there are twenty-one teams engaged in the business, with an average of thirteen hands to each team. The season thus far, has been favorable. Comparing the present operations with the past, the result of each team's labor, will be 1,000,000 of feet; which will make the total amount of lumber obtained on the St. Croix and its tributaries, this winter, twenty-one millions of feet, equal to eighty-four thousand dollars! Mr. Greely has two teams, and he will clear at least four thousand dollars, by his winter's work. But *such* groves of pine—and so handy to be obtained! From what pine I saw, and by what I learnt from others, I judge there is enough to last fifty years to come, to say nothing of the Rum river pinery, which is said to be equal to the St. Croix. Mr. F. Steel has five teams on Rum river, which is only twenty-five miles west of Greely's Station. I think the lumbering facilities of Minnesota, will eventually absorb most of the enterprises and speculations; as a good market can always be found for lumber below, which will, at the same time, be the means of our farmers having a market for all their surplus produce at their door, as lumbermen would rather pay a good price for supplies obtained in Minnesota than to be troubled to get them up from St. Louis or Galena.

TABLE OF STEAMBOAT ARRIVALS, ETC., AT FORT SNELLING FOR THE PAST SIX YEARS.

It shows the regular and rapid increase of business on the river, also the remarkable regularity of the appearance of water fowl in our waters, of which we have such abundant supplies, almost uniformly on and after the sixth day of every March.

1844—41 arrivals. Otter, Harris, first boat, April 6th. Geese and ducks flying, March 6th. Mississippi opened March 20th; closed November 23d, 1843.

1845—48 arrivals. Otter, Harris, April 6th, first boat. Geese and ducks flying, March 6th. Mississippi closed 26th November. Coldest day Feb. 19th, 18 degrees below zero.

1846—24 arrivals. Lynx, Atchison, March 31st, first boat. Ducks and geese flying March 1st. Coldest day January 25th, 19 degress below zero. Mississippi closed Dec. 5th.

1847—47 arrivals. First boat, Cora, Throckmorton, April 17th. —Mississippi closed November 29th. Geese and ducks flying March 17th. Coldest day February 18th, 37 degrees below zero.

1848—63 arrivals. First boat Senator, Harris, April 7th. Mississippi closed Dec. 4th. Feb. 18th, 26 degrees below zero. Geese and ducks flying March 6th.

1849—85 arrivals. Highland Mary, Atchison, first boat April 9th.—November 18th, first snow. Dec. 7th, Mississippi closed. December 30th, coldest day, 28 degrees below zero. Geese and ducks flying March 4th.

1850—104 arrivals. Highland Mary, April 19th. Nov. 15th first snow. Coldest day, February 3d, 28 degrees below zero. Geese and ducks flying March 10th. Dec. 4th, closed the Mississippi at St. Anthony.

April 19th. Steamboats Highland Mary and Nominee arrived through the ice at St. Paul landing.

May 24th. The steamboat Gov. Ramsey made her first trip from the Falls of St. Anthony to Sauk Rapids, 100 miles. This was the first attempt ever made to run a steamboat above the falls.

July. Great flood this month in the Upper Mississippi and its tributaries; the steamers Yankee, Nominee and Anthony Wayne, taking advantage of it, ascended the St. Peters river, from 100 to 200 miles further than its waters had ever been rippled by the paddle-wheels of a steamboat.

July 25th. The annual trading caravan from the half-breed settlements on the Red river of the North—in latitude 49 degrees —arrived in St. Paul. The distance travelled was over 600 miles. The caravan consisted of some two hundred ox carts, heavily laden with furs, &c., and attended by several hundred men, women and children.

Dec. 3. The Mississippi river closed at St. Paul. The last boat of the season left this port on the 19th of November.

A number of schools have been established in Minnesota, and to the imperishable honor of the Legislature we are informed that it has "made ample provision for the education of every child in or to come into the Territory."

ARTICLE VI.

REGULATION OF INTERNAL COMMERCE.

It appears from a circular, addressed to W. W. Green, Esq., Collector of the port of St. Louis, that the treasury department of the United States has requested the collectors of customs, and perhaps others, to suggest suitable plans for obtaining and arranging for publication the statistics of the internal commerce of the Nation; for the purpose, as it seems, of presenting the subject to the consideration of Congress at its next session. And regarding the measure in contemplation as highly important to all the leading interests of the country, we are moved by a sense of duty to offer a few remarks in favor of its adoption.

Owing to the vast extent of the United States and the rapid development of the resources of newly settled districts, there is, perhaps, no other nation where full and correct information respecting the production and consumption of every part of the country is so necessary as here; and no where else, we imagine, do intelligent men generally entertain such crude and vague ideas respecting their own commerce. Nor can it be expected that more enlightened and consistent views can be entertained until an efficient system of collecting and publishing facts shall have been adopted and reduced to practice.

It is owing chiefly to the want of correct information on this subject that so many conflicting opinions relating to the tariff, and also the excitement growing out of its discussion have prevailed—threatening, at times, even the dissolution of the Union. The importance of systematising the facts relating to our internal commerce, is becoming more apparent every year. Until within a few years past, almost the entire surplus products of the West were destined for the eastern and European markets; and the state of the demand and supply in our seaports and abroad, embraced the principal facts important to be known by the merchant and producer—the economy of the entire nation was involved in one system of commerce, the centre and controlling power of which was established in London. But a new commercial system is being developed in the valley of the Mississippi, based chiefly upon its manufactures and mineral resources; and, to the end that we may comprehend its operations and give it a wise direction, we must note all the principal facts as they occur. These facts, when collected and made public by authority of the general government, will arrest the attention of manufacturers and capitalists of other countries, and will doubtless be the means of inducing many to transfer their business to this region. The commercial and manufacturing statistics of western cities have hitherto been too imperfect to afford the kind of information which is most necessary to

enable us to understand the true nature and extent of our commerce. We need a regulation, by act of Congress, that shall provide for the registration of all commodities received, by public conveyance at least, at the principal cities, designating the state in which they are produced; and the quantity and place of destination of all commodities exported by rivers, canals, or railroads. The facts thus preserved would exhibit the annual progress of each State in agriculture, mining, and manufactures, with a sufficient degree of accuracy for most practical purposes; and would show very nearly the gross amount of provisions and other raw material consumed in the cities.

We are not advised that the civic government of any of our western towns, except St. Louis, has provided for the registration of imports; and here we believe no account is taken of the exports. No one can tell what proportion of our imports are consumed at this place or what part is exported to New Orleans, the Ohio river, or other markets.

We know that the number of steamboat arrivals from the Ohio river is increasing annually: and that the number of arrivals from N. Orleans has been decreasing for several years past; but whether the actual quantity and value of produce and general merchandize have increased or diminished, is left to conjecture, and so in respect to almost every thing relating to our internal commerce. Amidst such confusion of facts, it is not to be expected that either the people or their representatives can arrive at just conclusions touching the national or local interests.

Such a regulation may add considerably to the labors of the Custom House officers, and increase, perhaps, the cost of that branch of the public service; but these are matters which should not be regarded as objections to a measure of such general importance.

Indeed we can scarcely imagine that objections can be raised to its adoption by any party or from any quarter of the country; but it does not therefore follow as a matter of course that Congress will act favorably upon the subject. Measures that are not calculated to produce some degree of excitement, are always in danger of being neglected; and it is the duty of those most interested to urge them upon the attention of their representatives. It is rare that members of Congress take an active interest in measures that have not been discussed by their constituents; and, therefore, that the western delegation may be left without excuse in regard to this, we trust that the press will discharge its duty by bringing the subject fully before the country, with a view to the action of the next Congress.

The measure is one that should not be delayed. For the information which it is calculated to impart will, in many respects, be highly useful to the projectors of schemes of internal improvement and be the means of not only indicating the best systems, but of

securing the confidence and encouragement of capitalists. It will constitute the materials of which may be constructed a more enlightened system of impost duties on foreign commerce, and lead to a more permanent and uniform state of prosperity, than has heretofore been enjoyed by the people of this country.

ANALYSIS OF GRASSES.

[From the Genesee Farmer.]

Very few farmers duly appreciate the value of grass when turned to the best possible account. Broad acres have been too cheap, with their almost spontaneous herbage ready to be cropped by the domesticated animals of man, in this country, for him to study closely how to make two spires grow where only one grew before. In all the older States, however, this native abundance of nutritious forage and grazing is either gone or fast departing, never to return except through the art and science of the husbandman. The time has come when the study of the grasses is called for by every consideration of private interest and the public good.

In his account of the "Geographical Distribution of Grasses," Schouw remarks: "Persoon's Synopsis contains 812 species—1-26th part of all the plants therein enumerated. In the system of Rœmer and Sheiltes there are 1800; and since this work, were it brought to a conclusion, the family would probably contain *forty thousand* in all." This learned author adds: "The distribution of cultivated grasses is one of the most interesting of all subjects. It is determined not merely by climate, but depends on the civilization, industry, and traffic of the people, and often on historical events." The herdsmen of Switzerland find pastures for their cattle on mountain slopes above the range of forests; and the same is true on the high plateau of Central Asia. One of the most valuable books for reference, on this and all kindred topics, is Prof. Lindley's "Vegetable Kingdom"—a work which will pay well to reprint in this country. Prof. Emmons has given the results of his analyses of several varieties of grasses grown in the United States, and of red and white clover, in his "Agriculture of New York," which furnish many new and valuable facts. On page 70, vol. 2, he says:

"*Timothy Grass*—(*Phleum pratensis*)—First specimen, collected May 30, 1848. Stalk 24 inches long, head not visible.

Proportions—Stalk	65.30
Leaf	34.70
	100.00

Water in stalk	81.00
Dry matter	17.80
Ash	1.20
Ash calculated dry	6.74
Water in the leaf	75.00
Dry matter	23.00
Ash	2.00
Ash calculated dry	8.69
Water in the whole plant	78.00
Dry matter in the whole plant	20.46
Ash in the whole plant	1.60
Ash calculated dry	7.82."

As specimen No. 1 varies not from the above, we omit it. 100 parts of the ash of timothy hay gave the following results:

Silica	41.650
Phosphates	16.925
Carbonate of lime	0.200
Magnesia	0.500
Potash	30.760
Soda	1.020
Soluble silica	0.200
Chloride of sodium	2.490
Sulphuric acid	4.130
	97.875

By the above figures it will be seen that over 72 per cent. of the earthy matter removed from a meadow or pasture in the plant called timothy, is silica and potash—both of which are of course dissolved in water before they enter the roots of the plant. The stems of all grasses are large consumers of these minerals, which in a soluble condition are seldom abundant in any soil. As in wheat, rye, oats, barley, and maize straw, the quantity of ash varies considerably in different samples grown on unlike soils, so in timothy, red top, orchard and other cultivated grasses, the proportion of earthy matter varies in an equal degree. Nearly all meadows contain several species of this numerous family of social plants, besides more or less of clover. Probably 6 per cent of ash per 100 pounds of dry hay will be a fair estimate. This gives 120 pounds per ton of hay removed from the soil.

The ash of Red Top (*Agrostis Vulgaris*) differs especially from that of timothy. It contains much less potash and far more lime, as the following analysis by Prof. Emmons indicates:

Silica	41.90
Phosphates	13.75

Potash	4.92
Chloride of sodium (salt)	2.00
Carbonate of lime	10.03
Magnesia	6.64
Soda	9.61
Organic matter	2.35
Sulphuric acid	7.30
	98.50

From the quantity of lime, sulphuric acid, and soda in the above ash, it is aparent that gypsum and common salt in addition to wood ashes will be of great service on red top meadows. Salt and plaster are exceedingly valuable articles to mix with all stable and barn-yard manure, as well as with night soil, before their application to the land.

A luxuriant plant of Spear Grass (*Poa pratensis*), sometimes called herds grass [Kentucky blue grass, EDS. LOU. JOUR.], just headed out, gave of

Water	81.564
Dry matter	18.436
Ash	2.267
Ash calculated dry	12.296

Analysis of ash from well dried hay.

Silica	56.320
Phosphates	14.980
Carbonate of lime	3.540
Potash	15.624
Soda	6.828
Magnesia	1.996
Sulphuric acid	0.200
Chlorine	0.863
	100.351

Another specimen gave the following results, which Prof. E. suggests may be a fairer average sample of *poa pratensis* than the above:

Silica	48.300
Phosphates	11.050
Lime	0.030
Magnesia	trace.
Potash	3.531
Soda	12.505

Sodium	4.180
Chlorine	6.365
Sulphuric acid	5.156
Organic acid	4.400
	98.186

The quantity of chlorine, soda, and sodium (all of which are common salt) in the above deserves attention. The almost total absence of lime is remarkable. We respectfully suggest to farmers to try the easy experiment of sowing broadcast about two bushels of salt on an acre as an experiment, applying it five weeks before haying time. It will be more likely to benefit dry than wet meadows. Two bushels of salt and two of wood ashes, unleached, will doubtless pay well for the expense incurred.

In former volumes of this journal, we have frequently taken occasion to say, from our personal observation, that young clover, young corn, and other plants cut for soiling should be partially dried before feeding. The following results bear upon that question. Red clover gathered when nine inches high, contained

Water in the stem	88.30
Dry matter	10.95
Ash	0.75
Ash calculated dry	6.85
Water in the leaf	71.70
Dry matter	20.00
Ash	2.00
Ash calculated dry	10.00
Water in *leaf and stalk*	84.15
Dry matter	14.48
Ash	1.37
Ash calculated dry	9.46
Ash in a ton	211.68 lbs.

All plants, when young and growing rapidly, contain a large amount of water to facilitate the circulation of their aliment. There is more Water in 100 pounds of young clover or corn than in a like weight of blood. In the arterial blood of a horse there is about 76 per cent. of water: in that drawn from a vein a little less, say 757.251 in 1,000 parts. To keep horses, cows, working oxen, and sheep in health, and provide for them a generous supply of food, are objects of great importance to the farmer. Science will aid him much in this department of his great profession, if he will not treat her with rudeness or neglect.

ANALYSES OF INDIAN CORN.

The following analyses of Indian corn and the accompanying remarks on inorganic manures, appeared in Downing's Horticulturist some time last year, and appear to have been extracted from a prize essay on Indian corn, by Mr. Salisbury. It is stated that the essay of Mr. S. contains the analysis of twenty varieties. The following is the analysis of the common eight rowed yellow corn.

ANALYSIS OF THE WHOLE KERNEL.

Starch	50.64
Sugar and extract	7.46
Sugar	1.50
Fibre	6.28
Matter separated from fibre	0.05
Albumen	8.64
Casein	1.70
Gluten or zein	4.56
Oil	4.60
Dextrine or gum	4.84
Water	10.22
(In 100 parts, or)	100.48

ANALYSIS OF THE ASH OF KERNEL.

Carbonic acid	trace.
Silicic acid	1.450
Sulphuric acid	0.206
Phosphoric acid	50.955
Phosphate of iron	4.355
Lime	0.150
Magnesia	16.520
Potash	8.286
Soda	10.908
Chloride of sodium	0.249
Organic acids	3.100
(In 100 parts, or)	97.000

"We see by the (various foregoing) analyses that the several inorganic bodies removed from the soil by a crop of maize, rank as follows: commencing with the highest, silicic acid, soda, phosphoric acid and potash, sulphuric acid, magnesia and chlorine, lime and iron.

"The aggregate amount of inorganic bodies taken from an acre of land, annually, by a stout crop of maize, is by no means so large as is generally supposed; and yet it is sufficiently so to exhaust the best soil in a brief period of years of some of those bodies which act so essential a part in the constitution of the plant. The amount, generally, would not exceed 600 lbs. Indeed, it would, in a majority of cases, fall short of this. In some instances, however, of an ordinary stout growth of some of the larger varieties, it might even go up to 1,000 pounds; but such cases would rarely occur. Six hundred pounds may then be assumed as the quantity ordinarily removed from an acre of land by a stout crop of maize; or, what would be a better criterion to follow, one hundred pounds of inorganic matter for every ten of dry produce. Of this, about one-third is silicic acid, one-sixth soda, one-eighth potash, one-eighth phosphoric acid, one-twelfth sulphuric acid, one-eighteenth magnesia, one-eighteenth chlorine, and one-eighteenth lime and iron.

"The *silicic acid* is mainly removed by the straw or leaves, sheaths, and stalks. There is generally an abundance of this body in the soil; it only being necessary to secure the presence of a sufficiency of the *alkalies* to form with this acid enough of its soluble salts to meet the demands of the plant.

"The *potash* and *soda* enter quite largely into the composition of all parts of the plant; but more so into that of the stalks, grain, and cobs, than of the other portions. Soils, though they ordinarily contain considerable of these two bodies, yet they generally have a quantity by far too small to supply the lavish demands of this plant for any great length of time.

"*Phosphoric acid* enters largely into the grain, and quite largely into the cob and stalk. It constitutes about one-eighth of the ash of the entire plant. Soils are commonly deficient in this acid; or at least they contain much less of it than almost any other of the organic bodies which enter into the composition of plants. The quantity usually removed from an acre of land annually by a good crop of maize is from 60 to 75 pounds, or from 10 to 12 and 13 pounds per ton of dry produce.

"*Sulphuric acid*, from the quantity taken away by a crop seems to be an essential ingredient of this plant. It enters more largely into the leaves, stalks, and sheaths, than into the grain. From 45 to 60 pounds are removed by the annual produce of an acre, or from 7½ to 11 pounds per ton of dry plants.

"By referring to the foregoing calculations, we notice that the *magnesia* is removed from the soil in larger proportions than the lime; or, in other words, the maize plant requires more of the former than of the latter. This is by no means an uninteresting feature. About 16 per cent. of the ash of the grain is magnesia, while the same ash has usually less than one per cent. of lime. The magnesia in the kernels is usually in the state of a phosphate.

Lime enters more largely into all parts of the plant except the grain and cob than magnesia; yet the aggregate amount of the latter in the whole plant is greater than the former. Hence there is evidently as much necessity of adding magnesia to the soil for the maize crop as lime; and even more, if one of these bodies can be said to rank in importance before the other; since it enters so largely into the composition of the seed, constituting about one-sixth of its ash.

"Lime is often added to soils in considerable quantity, and has ever been considered "the basis of all good husbandry." The greater value of lime over that of magnesia, if any (in the maize crop) is in mechanically and chemically influencing the soil, aside from serving directly as food to the plant. Indeed, it is by no means a settled question that magnesia, when properly applied, exerts a less beneficial influence upon the soil than lime. Neither of those bodies, however, possess the property of maintaining, unimpaired, the original richness of a soil. Hence one cannot be strictly said to be more valuable than the other. There is an equal necessity of returning any or all of the other inorganic bodies which are removed from the land, as they become less in quantity in the soil than is necessary amply to supply the healthy demands of the plant, as there is in returning either or both of these as they become deficient."

CURCULIO.

This is, perhaps, the most destructive enemy to plums and other fruits of the smaller varieties, that is known to the Horticulturist of this country. And notwithstanding the many remedies that have been prescribed by observing individuals in this and other countries, but little has been done to prevent its ravages. The following observations on the habits and character of this insect were made in this vicinity by one of our most successful Horticulturists, and are, in our opinion, worth more than all the other remedies combined, that we have seen published.

The author is entitled to the gratitude of fruit growers and the lovers of good fruit everywhere, for his patient and intelligent investigation of the habits of this destructive insect.

The article was written for the Western Horticultural Review, but we take pleasure in giving it a place in our Journal for the benefit of our readers. EDITORS.

ST. LOUIS, February, 1851.

MR. EDITOR: By inserting the following you may perhaps save

some one the time, expense and disappointment I have experienced in the last four or five years, in following out the hundred and one remedies in guarding against the attacks of the Curculio.

Last year I varied my mode of warfare by spreading a thick coat of cement on the ground under thirty-five plum trees, extending it to the full size of the tops of the tree. As soon as the plum made its appearance from the blossom, say about the 10th of May, I commenced jarring the trees every morning and evening, and continued to do so, until the 1st of August, and as the insects fell upon the cement, killed them. The first three weeks, the average number was not far from fifty per day. From the first of June to the 20th, nearly one hundred per day; after which time they gradually diminished.

Now for the result: From the thirty-five plum trees, comprising fifteen different varieties, I saved only about two bushels.

It is argued by many that this insect has great instinctive powers, and will not deposit its egg, where the fallen fruit is likely to encounter a pavement.

I know nothing about your eastern or northern Curculios, but I can assure you Mr. Editor, no such repugnance is felt or known by this insect in Missouri, and further, that no pavement ever invented, where Curculios are numerous, will guard against their attacks, unless extended to every fruit tree in the garden or orchard. It is wholly inconsistent with the nature and habits of this insect, to suppose that paving under a few trees will protect the fruit, while others, near by, are unpaved, for the simple reason that the Curculio attacks nearly every description of fruit. The nectarine and plum are their favorites, but the apple, pear, peach, apricot, cherry and grape are all subject to their attacks, and all serve absolutely as a means of reproduction.

I have taken the above mentioned fruits separately, placed each in different boxes of earth, and from four to six weeks the change from larva to the perfect Curculio would be complete.

There are three distinct species of this insect, one smaller, the other larger than the plum Curculio. The small one is nearly round, about half the size of the plum Curculio, and is mostly found upon grapes. The other is full a half size larger with a smooth shell and are not so numerous as either of the other kinds. Both of these insects, instead of making the well known crescent mark of the plum Curculio, perforate the fruit by boring a small round hole, in which they deposit their eggs with the same certainty of destroying it, as the plum Curculio.

During the time of jarring the trees, not a day passed without finding more or less of the two new species above described, in about the following proportion: Plum Curculio 25, Small do. 8, Large do. 3.

At the proper season of the year, by watching their movement patiently, large numbers will be seen emerging from the ground,

and after surveying their position, will follow the instinct with which nature has endowed them, by crawling up the tree instead of flying. I have often checked their progress in this way by putting a thick piece of pastboard around the tree in the shape of an inverted funnel, but their wings were soon brought into requisition to overcome the difficulty. They can apparently fly to a great distance, and in high winds are blown in every direction, for after such winds I have found them in different rooms in the first and second story of the house.

Your readers will naturally say, all this is very well, but give us a remedy that will effectually guard against the enemy.

I can safely say, there is a remedy, and a philosophical one, which, if faithfully carried out, will insure good crops of fruit so far as Curculio are concerned. First, then, cut off all means of reproduction by picking up every description of fallen fruit two or three times a week, and subjecting it to some process that will effectually destroy the grub or larva.

No advantage will be derived from this process the first year, for the curculio is already in the ground; but the satisfaction of having a good crop of plums the second year, will well repay for all the trouble of picking up the fruit.

I have studied the character and habits of these insects for the last ten years—have watched its movements for days and weeks—have tried every remedy published in the different agricultural works, all of which have totally failed, except jarring the trees, and paving, and these have only proved partially successful.

By picking up every description of fallen fruit no possible means are left for them to perpetuate their species. I am not aware that it has ever yet been discovered, that the Curculio can in any other way propagate its species, than by depositing its eggs in some description of fruit—and whatever description of fruit that may be, it must come in contact with earth in such a manner that the grub can escape, and bury itself beneath the surface.

No one can reasonably expect to be entirely exempt from this insect, as long as their neighbors are troubled with them, for some few will fly, or be blown into the trees under any and every circumstance, unless completely shielded by some covering or net work.

The most complete and accurate description of this insect, according to my own observations has been given by M. H. Simpson, of Massachusetts, in the June number of Downing's Horticulturist for 1850.

In this communication a remedy was given to guard against the Curculio, which proved eminently successful with Mr. Simpson and a Mr. Young of Kentucky, viz. syringing the trees with lime water. This remedy I have never tried.

STATEMENT EXHIBITING THE NUMBER OF AMERICAN AND FOREIGN VESSELS, WITH THEIR TONNAGE, WHICH ENTERED INTO THE UNITED STATES FROM FOREIGN COUNTRIES, DURING THE YEAR ENDING JUNE 30, 1850.

	American vessels.		Foreign vessels.		Total.	
To	No.	Tons.	No.	Tons.	No.	Tons.
Russia	34	12.877	6	2.121	40	14.998
Prussia	1	240	...	.....	1	240
Sweden and Norway	10	3.391	74	23.554	84	26.945
Swedish West Indies	4	449	1	45	5	494
Denmark	1	396	2	592	3	988
Danish West Indies	78	12,940	5	956	83	13,896
Holland	40	17.884	34	11.967	74	29.851
Dutch East Indies	8	3.689	....	.....	8	3.689
Dutch West Indies	143	22.964	23	3.248	166	26.212
Dutch Guiana	20	3.892	1	123	21	4.015
Hanse Towns	29	23.331	154	65.664	183	88.995
Belgium	49	23.033	15	5.756	64	28.789
Hanover	6	2.751	9	3.978	15	6.729
England	718	489.838	732	421.530	1.450	911.368
Scotland	40	18.906	113	55.026	153	73.932
Ireland	32	10.022	200	77.507	232	87.529
Gibraltar	7	2.334	1	290	8	2.624
Malta	1	168	1	236	2	404
British East Indies	51	23,537	....	.....	51	23.537
British West Indies	396	69.302	350	49.230	746	118.532
British Guiana	16	2.738	11	904	27	3.642
British Honduras	32	4.386	5	615	37	5.001
Cape of Good Hope	3	773	....	.....	3	773
British North American Col.	357	55,465	4,046	333.426	4.403	388.891
Canada	2.876	889.755	3.282	447.372	6.158	1.337.127
Newfoundland	1	122	15	1.695	16	1.817
Faulkland Islands	....	.....	91	17.434	91	17.434
Other British Possessions	6	1.223	....	.....	6	1.223
France on the Atlantic	185	106.307	107	32.637	292	138.944
France on the Mediterranean	28	8.560	39	10.215	67	18.775
Bourbon	....	.....	1	266	1	266
French West Indies	20	2.859	19	4.627	39	7.486
French Guiana	10	1.224	2	98	12	1.322
Miquelon & French fisheries	3	618	....	.....	3	618
French possessions in Africa	1	359	....	.....	1	359
Spain on the Atlantic	39	17.538	12	4.779	51	22.317
Spain on the Mediterranean	55	12.827	76	22.894	131	35.721
Teneriffe and other Canaries	11	2.173	5	1.215	16	3.388
Manilla & Philippine Islands	21	10.259	4	1.176	25	11.435
Cuba	1.250	249.307	90	33.030	1.340	282.337
Porto Rico	262	41.768	25	3.074	287	44.842
Portugal	9	2.768	26	5.018	35	7.786
Madeira	8	1.586	2	336	10	1.922
Fayal and other Azores	5	1.050	9	1.717	14	2.767
Cape de Verds	....	.....	....	.....	....	.....
Sicily	107	31.417	37	9.511	144	40.928
Sardinia	4	1.833	27	7.399	31	9.232
Tuscany	17	6.701	26	7.871	43	14.572
Ionian Islands	3	803	....	.....	3	803
Trieste and other Austr. ports	11	4.398	5	2.205	16	6.603
Turkey	23	6.076	2	429	25	6.505
Mexico	130	22.585	89	26.039	219	48.624
Central America	23	3.549	4	653	27	4.202
New Granada	195	104.176	20	5.295	215	109.471
Venezuela	72	11.536	17	2.708	89	14.244
Bolivia	4	846	7	1.280	11	2.126
Brazil	258	62.965	35	9.363	293	72.328
Argentine Republic	54	13.930	49	13.081	103	27.011
Cisplatine Republic	1	90	4	1.185	5	1.275
Chili	39	14.510	71	18.369	110	32.879

STATEMENT OF THE ENTRANCES OF AMERICAN & FOREIGN VESSELS—CONTINUED.

To	American vessels.		Foreign vessels.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.
Peru	13	5.100	10	1.808	23	6.908
China	41	21.969	23	7.445	64	29.414
Hayti	320	44.690	35	6.289	355	50.979
South Sea Islands	4	1.101	10	1.891	14	2.992
South America	....	.....	9	2.586	9	2.586
Asia generally	3	945	....	.....	3	945
Africa generally	47	8.531	2	384	49	8.915
Equador	2	331	5	828	7	1.159
Pacific Ocean	90	30.502	....	.....	90	30.502
Atlantic Ocean	19	2.685	....	.....	19	2.685
Indian Ocean	15	3.679	....	.....	15	3.679
Sandwich Islands	39	9.267	24	4.195	63	13.462
Australia	5	1.126	....	.....	5	1.126
Liberia	3	993	....	.....	3	993
Uncertain places	1	198	1	468	2	656
Patagonia	3	875	....	.....	3	875
Total	8.412	2.573.016	10.100	1.775.623	18.512	4.348.639

STATEMENT EXHIBITING THE NATIONAL CHARACTER OF THE FOREIGN VESSELS WHICH ENTERED INTO AND CLEARED FROM THE UNITED STATES, FOR FOREIGN COUNTRIES, DURING THE YEAR ENDING JUNE 30, 1850.

	ENTERED.			CLEARED.		
	No.	Tons.	Crew.	No.	Tons.	Crew.
Russian	64	26.283	960	61	25.253	912
Prussian	52	15.901	615	38	12.192	462
Swedish	182	58.098	2.342	189	59.946	2.324
Danish	53	11.046	549	53	11.220	548
Hanseatic	199	74.776	2.919	210	77.570	3.083
Dutch	29	8.867	370	30	10.859	437
Belgian	15	5.193	222	15	5.131	228
Mechlenburg	6	1.625	65	3	740	28
Oldenburg	9	2.003	91	10	1.964	84
Hanoverian	9	1.727	78	11	2.545	114
British	8.999	1.450.539	77.642	8.715	1.404.799	75.145
French	116	30.762	1.527	106	27.644	1.360
Spanish	134	37.296	1.850	135	36.279	1.823
Portuguese	20	3.730	188	15	2.409	121
Austrian	16	7.489	270	13	6.447	227
Sardinian	44	11.790	586	35	9.852	462
Sicilian	22	5.703	270	18	4.455	203
Mexican	30	2.786	222	35	3.065	254
Venezuelan	10	1.713	80	11	1.938	92
Brazilian	9	2.382	109	9	1.899	90
New Granadian	5	693	38	6	1.618	72
Argentine	4	702	40	2	484	23
Cisplatine	1	255	15	2	313	19
Chilian	31	6.712	349	42	8.754	454
Hawarian	15	1.901	98	13	1.524	89
Peruvian	15	3.615	203	21	5.233	261
Tahatian	2	272	19	2	676	36
Equadorian	4	864	42	8	1.928	98
Haytien	2	307	14	2	307	14
Central American	2	204	15	1	78	9
German	1	354	14	....	.....	....
Lubeck	....	.....	....	2	584	22
Neapolitan	....	.....	....	2	410	19
Chinese	....	.....	....	1	98	5
Total	10.100	1.775.623	91.801	9.816	1.728.214	89.118

STATEMENT EXHIBITING THE NUMBER OF AMERICAN AND FOREIGN VESSELS, WITH THEIR TONNAGE, WHICH ENTERED INTO EACH DISTRICT OF THE UNITED STATES, FROM FOREIGN COUNTRIES, DURING THE YEAR ENDING JUNE 30, 1850.

Into	American vessels.		Foreign vessels.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.
Passamaquoddy	53	9,257	667	49.196	720	58.453
Machias	2	332	1	57	3	389
Penobscot	9	2.710	5	1.430	14	4.140
Waldoborough	2	260	4	232	6	492
Wiscasset	4	1.025	....	.....	4	1.025
Belfast	6	820	....	.....	6	820
Bath	23	6.935	44	3.159	67	10.094
Bangor	22	3.198	2	167	24	3.375
Portland	131	28.624	316	35.571	447	64.195
Saco	1	148	1	65	2	213
Portsmouth	9	3.572	101	7.472	110	11.044
Vermont	330	86.828	174	12.607	504	99.435
Newburyport	10	2.110	118	6.495	128	8.605
Gloucester	19	3.487	159	8.180	178	11.667
Salem and Beverly	89	15.523	297	21.273	386	36.796
Boston	967	268.550	1.905	218.309	2.872	478.859
Marblehead	3	969	174	11.117	177	12.086
Plymouth, Mass.	....	.....	10	544	10	544
Barnstable	13	1.971	29	1.742	42	3.713
Fall River	56	10.201	22	2.528	78	12.739
New Bedford	122	32.121	12	1.033	134	33.154
Edgartown	66	12.576	6	710	72	13.286
Nantucket	....	.....	....	.....	....	.....
Providence	54	10.081	15	1.705	69	11.786
Bristol	33	5.534	....	.....	33	5.534
Newport	13	2.232	4	470	17	2.602
Middletown	2	249	1	61	3	310
New London	23	7.018	3	858	26	7.876
New Haven	64	10.771	25	5.406	89	16.177
Stonington	10	2.894	....	.....	10	2.894
Fairfield	10	1.648	50	5.247	60	6.895
Champlain	406	89.520	283	18.437	689	107.957
Oswegatchie	192	144.549	188	52.366	380	196.915
Sacket's Harbor	254	152.060	25	1.109	279	153.169
Oswego	681	122.311	976	73.482	1.657	195.793
Niagara	213	71.979	368	101.307	581	173.286
Genesee	70	20.548	145	19.529	215	40.077
Cape Vincent	238	149.647	43	6.704	281	156.351
Buffalo	199	16.741	523	91.596	722	108.337
New York	1,882	734.431	1.281	410.900	3.163	1.145.331
Greenport	2	504	....	.....	2	504
Philadelphia	352	100.009	185	32.361	537	132.370
Newark	....	.....	17	1.601	17	1.601
Delaware	....	.....	....	.....	....	.....
Baltimore	295	70.427	143	29.161	438	99.588
Georgetown, D. C.	7	1.260	2	154	9	1.414
Alexandria	14	3.039	45	7.599	59	10.638
Norfolk	43	6.415	31	7.866	74	14.281
Petersburg	3	1.655	6	1.862	9	3.517
Richmond	5	688	3	1.123	8	1.811
Tappahannock	4	393	3	325	7	718
Wilmington	70	11.555	48	9.115	118	20.670
Newbern	23	2.664	....	.....	23	2.664
Camden	22	2.170	....	.....	22	2.170
Beaufort, N. C.	4	473	....	.....	4	473
Washington	9	2.118	....	.....	9	1.118
Plymouth, N. C.	12	1.205	....	.....	12	1.205
Charleston	161	52.414	142	44.205	303	96.619
Georgetown, S. C.	2	297	....	.....	2	297
Savannah	47	11.883	71	45.134	118	57.017
Key West	44	4.216	24	1.163	68	5.379

STATEMENT OF ENTRANCES OF AMERICAN AND FOREIGN VESSELS, ETC.—CONTINUED.

	American vessels.		Foreign vessels.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.
Appalachicola	10	2.965	14	9.231	24	12.196
Pensacola	2	337	....	.....	2	337
St. Augustine	....	.....	1	68	1	68
Mobile	40	11.914	112	84.106	152	96.020
Teche	2	904	....	.....	2	904
New Orleans	522	175.065	374	174.884	896	349.949
Cuyahoga	128	14.306	123	17.128	251	31.434
Sandusky	50	7.322	13	1.115	63	8.437
Detroit	79	5.651	384	48.479	463	54.130
Michilimackinack	18	1.603	10	1.230	28	2.883
Chicago	18	6.690	4	648	22	7.338
Galveston	1	93	9	2.894	10	2.987
Brazos St. Iago	2	401	4	283	6	684
San Francisco	140	47.950	355	82.914	495	130.864
Total	8.412	2.573.016	10.100	1.775.623	18.512	4.348.639

TONNAGE OF THE UNITED STATES ON THE 30TH OF JUNE, 1850.

REGISTERED TONNAGE.

Registered vessels employed in foreign trade ..... tons.		1.585.711 22

ENROLLED AND LICENSED TONNAGE.

Enrolled vessels employed in the coasting trade	1.755.796 42	
Licensed vess. empl. in coasting trade under 20 tons	43.027 86	
		1.797.824 33

FISHING VESSELS.

Enrolled vessels employed in cod fishery	85.646 30	
Enrolled vessels employed in mackerel fishery	58.111 94	
Enrolled vessels employed in whale fishery	.....	
Licensed vessels under 20 tons employed in cod fishery	8.160 34	
		151.918 63
Total		3.535.454 23
Registered tonnage employed in whale fishery	146.016 71	
Registered ton. employed other than in whale fishery	1.439.694 46	
	1.585.711 22	

DESCRIPTION OF TONNAGE.

Aggregate amount of tonnage of the U. States on 30th June, 1850		3.535.454 23
Whereof—		
Permanent registered tonnage	1.262.574 74	
Temporary registered tonnage	323.135 43	
Total registered tonnage		1.585.711 22
Permanent enrolled, and licensed tonnage	1.879.514 00	
Temporary enrolled, and licensed tonnage	20.040 71	
Total enrolled and licensed		1.899.554 71
Licensed tonnage, under 20 tons, employed in coasting trade	42.027 86	
Licensed tonnage, under 20 tons, employed in cod fishery	8.160 34	
Total licensed tonnage under twenty tons		50.188 25
Total		3.535.454 23

Of the enrolled and licensed tonnage there were employed in the—	
Coasting trade	1.755.796 42
Cod fishery	85.646 30
Mackerel fishery	58.111 94
	1.899.554 71
Of the registered tonnage, amounting, as stated above, to 1.585.711 22 tons, there were employed in steam navigation	44.942 25
Of the enrolled and licensed tonnage amounting, as stated above, to 1.899.554 71 tons, there were employed in steam navigation	481.004 65
Total tonnage in steam navigation	525.946 90

MERCHANTS' LICENSE LAW OF MISSOURI.

Owing to the great interest that has been felt in this case we desired to publish the opinions of all the judges at large; but, finding them too long for admission in our Journal, we have limited our notice of the case to the following statement of the pleadings and evidence which we copy from the opinion of Justice Ryland.

WAYMAN CROW, *et. al.*, Appellants,
vs.
STATE OF MISSOURI, Appellee. } On appeal.

The appellants (defendants below,) were indicted in the Criminal Court of St. Louis county, for dealing as merchants without taking out a license, as required by the statutes of the State.

The indictment contains six counts. The first charges that defendants unlawfully did receive for sale and unlawfully did deal as merchants in the selling of goods, wares and merchandise not the growth, produce or manufacture of this State, by then and there and on divers other days and times receiving for sale and selling as merchants as aforesaid, fifty yards of cloth, fifty yards of domestic, &c., &c., at a place then and there, and on other days and times occupied by them for that purpose, to divers persons unknown, without having any license, &c.

The second count charges the same facts as the first, with this exception, that it omits to state that the goods, wares and merchandise received and sold were not the growth, produce and manufacture of this State. The third count charges that the defendants did import into the State, and unlawfully receive for sale and unlawfully did deal as merchants in selling, at the place and on the days aforesaid, goods, wares and merchandise, (naming them) not the growth, manufacture or produce of this State, but of England, in Great Britain; which importing, receiving and selling were in the original packages, bales and forms, as imported from England. This count also states that the duties had been regularly paid to

the United States on the said goods, &c., without a license. The fourth count charges that defendants imported and received for sale, and sold on the days and times and at the place aforesaid, goods, wares and merchandise, the produce, growth and manufacture of New York, Pennsylvania, and other States of the Union, which selling was in the original packages, and also in broken packages, without a license.

The fifth count charges that defendants imported goods, wares and merchandise into this State from sister States, and received and sold the same as aforesaid in the original packages unbroken, in which they were received by wholesale without a license.

The sixth count is not materially different from the first. The defendants filed a demurrer to all the counts of the indictment. The demurrer was sustained to the second and third counts, and overruled as to all the others. A jury was then empanneled to try the issue on not guilty to the counts which had been held good on the demurrer. The evidence was as follows: The defendants at the time mentioned in the indictment were merchants, doing business in St. Louis, and received for sale at their store the goods, wares and merchandise mentioned in the indictment, in manner and form as therein charged, without a license. That all the goods, &c·, so received and offered for sale by defendants were imported directly by them into this State from other States of the Union and foreign countries, and were not the growth, produce or manufacture of this State, and that the defendants did exercise the business of merchants by selling the goods, &c., mentioned in the indictment, as charged in all the counts, except the second and third counts, and this was all the evidence.

The defendants then moved the court to give the following instructions to the jury, that "if defendants received for sale, and sold at their store in St. Louis, no other goods except such as were imported into this State by them, directly from other States of the Union, the jury will find for the defendants." This the court refused to give, and the defendants excepted. The defendants were found guilty. They afterwards filed their motion for a new trial, and in arrest of judgement, raising again the questions of the propriety of the conviction on the testimony and of the legal sufficiency of the indictment. The court decided both these motions against the defendants; they again excepted, and bring the case before this court for revision. A reversal of the judgment of the Criminal Court has been insisted on before this court, upon grounds radical and fundamental, looking to nothing less than the absolute nullity of the laws upon which the counsel for the State rely to uphold the indictment. The cause was first brought before this court at the October term, 1850, at which time it was ably discussed at the bar, and was decided by the court, a majority feeling themselves bound by a sense of duty to declare the indictment insufficient to sustain the judgment of the Criminal Court, the provision of the

statutes upon which it was found, being in their opinion unconstitutional.—Subsequently, a re-argument was asked for and obtained by the counsel for the State. This court being deeply impressed with the magnitude of the subject, and of the great importance to the State of coming to a right conclusion, at this present term, the cause was again submitted to the court on full written arguments by the respective counsel, and the whole field of the controversy once more carefully reviewed.

The Supreme Court reversed the judgment below and ordered the defendants to be discharged from the indictment; but owing to the nature of the several questions involved, and the conflicting views entertained by each of the judges, it is difficult to determine to what extent this vexatious subject has been settled, or how far the decision will affect the revenue of the State.

According to our understanding, the decision abolishes the advalorem tax on merchandize sold at retail; but recognizes the validity of the act passed 12th March, 1849, which provides for the collection "upon every merchant's and grocer's license" of a tax of 20 cents on every hundred dollars worth of merchandize received for sale, whether for wholesale or retail.

We had thought of reviewing the decision, but perceiving that it would require more labor than we can devote to that object, we must leave the task to others. We brought the subject before the country in the Feb. number, 1849, of the Western Journal, with a view to a reformation of the revenue laws touching merchants and merchandize. In preparing our views, as then submitted, we arrived at the conclusion that the license laws were in violation of the constitution of the State; and so far as it embraced the products of sister States, offered for sale in packages, bales, barrels, &c., we considered it in violation of the constitution of the United States; and our opinions on these points have ben confirmed by the able and, as we believe, unanswerable arguments of Justice Ryland.

MISSISSIPPI AND ATLANTIC RAILROAD.

In noticing the public works in Illinois, in the March number of the Western Journal, we remarked in connection with the Mississippi and Atlantic Railway, that "the legislature having refused to sanction the termini, the prosecution of the work will, as we suppose, be suspended until a judicial decision can be had on the right of the Company to proceed." This, in connection with cer-

tain remarks contained in the address of the President of the Terre Haute and Alton Railroad Company, published in our March number, is complained of by a friend of the Mississippi and Atlantic Railway as calculated to impair the confidence of the public in the right of that company to prosecute their enterprise by virtue of their association under the general law. If such should be the case, we can but regard what we have said and published on that subject, with regret; but, in reviewing the entire matter objected to, we find nothing which, in our judgment, can be tortured into an opinion on our part respecting the rights of the company. Nothing was more natural than to suppose that refractory owners of land would be found on the route who would contest the right of the company to condemn land without the sanction of the termini by the legislature; and we supposed that it would be the true policy of the company to remove every doubt as to their rights, before they commenced the work.

In that portion of the address of the President of the Terre Haute and Alton Railroad, which we published in the April number, he says, "The charter of the Terre Haute and St. Louis Railroad has been again vetoed by the voice of the same legislature, by a vote so decisive and in a manner so fortunate, as to preclude all hope of its ever being resuscitated, provided that we now make such an efficient commencement of the work upon our road as will amount to a sure guarantee of its early completion." Our object in publishing this address was simply to make known to our readers the steps that were being taken by that company towards the commencement of the work—we never imagined that we were making ourselves responsible as endorsers of the assertions or opinions contained in that document.

We have noticed this matter chiefly for the purpose of asserting the policy which we have adopted, as journalists, in reference to all works of public improvement. One of our most cherished objects in the beginning was to incite a spirit of public improvement throughout the valley of the Mississippi and to suggest the outlines of a plan that would constitute the basis of a general system—but we resolved never to oppose any work of improvement for the purpose of building up a rival. If the citizens of any part of the country desire to construct a railroad or other improvement, and are willing to devote their means and labor to its accomplishment, we say God speed. Allow all to exercise this privilege, and in time every part of this great valley will be supplied with commercial and traveling facilities adapted to the wants of each—unreasonable monopolies will be avoided, and the resources of every part of the country more fully developed. Acting upon this policy, we take no part in the contest between rival works in Illinois. As a part of a great system, we have frequently commended the line of improvement from Illinoistown to Terre Haute; and the necessity of this work, as a part of a general system for the West, is so

obvious, that we have never doubted, nor do we yet doubt, that it will be sooner or later constructed. We have never examined the authority under which the Mississippi and Atlantic Railroad Company are acting; but we have been informed that they are advised by eminent lawyers that they possess ample power under their present organization to progress with the work without further legislation—we trust this may be true. But in our opinion the people of Illinois would be benefitted by both routes: and if they are willing to invest their means in constructing them, so much the better for the State. We are much gratified to learn that the Mississippi and Atlantic Railroad Company are resolved on prosecuting that great enterprise. No one can doubt of the utility of the improvement, or that the stock will pay large dividends, although the Alton and Terre Haute road should be constructed.

DISCURSIVE VIEWS ON VARIOUS ÆSTHETIC SUBJECTS.

FROM THE GERMAN OF SCHILLER.

All the properties of things, by which they become æsthetic, may be brought under four different classes, which, according to their *objective* difference, as well as their different *subjective* relations, produce different kinds of satisfaction, affecting not only the *strength*, but also the *worth* of our passive and active faculties, and, touching the fine arts, are of extraordinary utility; namely, the *Agreeable*, the *Good*, the *Sublime*, and the *Beautiful*.

Among these the Sublime and Beautiful alone belong to Art. The Agreeable is not worthy of it, and the Good is at least not its aim; for the aim of Art is to please, and the Good, theoretical or practical, cannot, neither is it allowed to serve as a means for the indulgence of the senses.

The Agreeable is pleasing only to the Sense, and therein differs from the Good, which gives delight only to the Reason. The one pleases through its material quality, for only that which is material can affect the Sense, and the Perfect, which is Form, gives delight only to the Reason.

The Beautiful delights, it is true, through the medium of the senses, in which respect it differs from the Good, but it delights through its Form of Reason, in which respect it differs from the Agreeable. The Good may be said to occasion delight, by means merely of the Form *suitable* to Reason, the Beautiful by means of the Form *similar* to Reason, the Agreeable by means of no Form whatever. The Good is *perceived by thought*, the Beautiful *contemplated*, the Agreeable *only felt*. The first occasions

delight in the idea, the second in the observation, the third in the material sensibility.

The distinction between the Good and the Agreeable is manifest in a great degree at a glance. The Good expands our knowledge, because it creates and presupposes an idea of its object; the basis of our satisfaction lies in the subject, when even the satisfaction itself is a condition in which we find ourselves. The Agreeable on the contrary presents no knowledge whatever of its object, and its basis rests also on none. It is Agreeable only because it excites sensibility, and the idea of it disappears entirely as soon as we allay by thought the excitability of the senses, or even only produce a change upon them. A warm air is agreeable to a man who feels cold; but even this man will seek a cooling shade in the heat of summer. Yet in both cases, it may be maintained, he judged correctly. The Objective is altogether independent of us, and that which presents itself to us to day as true, judicious, reasonable, will also (provided we judged correctly to-day) appear to us in the same manner twenty years hence. Our judgment in regard to the Agreeable is changed as often as our condition varies in relation to its object. There is therefore no property of objects, except that which arises first out of the relation of an object to our senses—for the state of the senses is a necessary condition of the same.

The Good on the contrary is already good before it is conceived and felt. The property through which it pleases exists perfectly within itself, without the necessity of our subject, when even the satisfaction we derive from the same rests on a susceptibility of our being. It may therefore be said that the Agreeable *exists only, because it is felt;* the Good, on the contrary, *is felt, because it exists.*

The distinction between the Beautiful and the Agreeable, as great as it may be in other respects, is less manifest at a glance. The Beautiful is like the Agreeable in this respect, that it must always be presented before the senses, that it pleases only in the appearance. It is like it, further, therein that it neither creates or presupposes any knowledge of its object. But again, the Beautiful differs very much from the Agreeable, because it pleases through the Form of its appearance, not through the material feeling. It gives delight, it is true, to the reasonable subject only so far as the same is likewise sensuous; but is also pleasing to the sensuous only, so far as the same is likewise reasonable. It is pleasing not only to the individual, but to men in general, and it is sustained only by its relation to a sensuously reasonable being, yet it is independent of all empirical determination of sensuality; and it remains the same, even when the individual peculiarity of the subject varies. The Beautiful has also even that in common with the Good, wherein it differs from the Agreeable, and varies from the Good even in that respect, wherein it resembles the Agreeable.

In regard to the Good this point is to be understood, wherein the Reason distinguishes a fitness to its theoretical or practical laws. But there may be a perfect harmony of the same object with the theoretical Reason, and yet the practical may be in the highest degree antagonistic. We may disapprove the object of an undertaking, and yet admire the means used to obtain the object. We may despise the enjoyment in which the voluptuary indulges as the aim of his life, and yet praise his ingenuity in the choice of the means used, and the consistency of his principles. That which pleases us only by its form is good, and it is absolutely and without condition good, when its Form is also at the same time its Substance. The Good is also an object of feeling, but of no immediate feeling, as the Agreeable, and also of no mixed feeling as the Beautiful. It does not excite coveteousness as the first, nor inclination as the second. The pure idea of the Good induces only reverence.

After the determination of the lines of distinction between the Agreeable, the Good and the Beautiful, it is clearly evident that an object may be ugly, imperfect, yes, even morally worthless, and yet be agreeable, yet may please the senses; that an object may be revolting to the senses, and yet be good, may be pleasing to the Reason; that an object may be revolting to the inner being, according to the moral feeling, and may yet be pleasing in contemplation, yet be beautiful.

The cause of this is on account of the fact, that, among all these different representations, another faculty of the disposition of the mind, and one of a different order, is interested.

But the classification of the æsthetic predicates is not yet herewith exhausted; for there are objects which at the same time that they are ugly, repugnant and horrible to the senses, unsatisfying to the understanding, and indifferent in a moral estimation, are yet pleasing, yes, pleasing in a degree so high, that we gladly sacrifice the gratification of the senses and of the understanding, to procure for ourselves the enjoyment of the same.

Nothing is more charming in nature than a beautiful landscape in the crimson glow of evening. The rich variety and the gentle outline of images, the continuously changing play of light, the slight veil which envelops the distant objects—all unite together to delight our senses. The soft murmur of a waterfall, the trilling notes of the nightingale, an agreeable music, increase our pleasure. We are dissolved in a repose of sweet sensibility, and while our senses are being touched most agreeably, by the harmony of colors, of images and of tones, the disposition of the mind is delighted on a gentle and high-spirited train of ideas, and the heart on a stream of feelings.

Suddenly a storm arises which darkens the sky and the whole landscape, which overwhelms or silences all other tones, and robs us immediately of every pleasure. Pitch black clouds overcast the horizon, deafening claps of thunder descend, flash follows flash,

and our sight and hearing are disturbed most disagreeably. The glare of the lightning makes the horrors of night only more visible around us. We see how the lightning strikes: yes, we begin to fear that it might also hit us. Nevertheless we believe we have rather won than lost by the exchange, except those persons whom fear robs of all freedom of judgment. This frightful spectacle that repels our senses, in one respect, attracts us powerfully, and we linger by the scene with a feeling, which indeed cannot with propriety be called enjoyment, but which is far preferable to enjoyment. But now this spectacle of nature is rather destructive than good (at least it is not necessary to think on the utility of a thunder storm, in order to find satisfaction at this appearance of nature,) it is rather hideous than beautiful, for darkness as a deprivation of all representations which light furnishes, can never be pleasing, and the sudden air-concussion by means of thunder, as also the sudden air-illumination by means of lightning, oppose a necessary condition of all beauty, which harmonizes in its nature with nothing abrupt, nothing powerful. Farther, this appearance of nature is rather painful than pleasing to the naked senses, because the nerves of the sight and of hearing are by turns painfully strained and excessively slackened, by means of the sudden alternation of darkness and light, of the crash of thunder and stillness. Yet in spite of all these causes of dissatisfaction, a thunder storm is, for him who does not fear it, a fascinating scene.

Farther. In the midst of a green and smiling plain, let a wild barren hill be projected, which intercepts a part of the view. Every one would wish this heap of earth away, as something that deformed the beauty of the whole landscape. Now suppose this hill became higher and higher, without being changed in the least degree in regard to its form in other respects, so that the same relation would be sustained between its breadth and heighth, also even its greatness. In the first place, on that account, the dissatisfaction will increase, because the increasing greatness of the hill makes it only more remarkable, only disturbs you the more. But in continuation let the size of the hill be increased more than twice the height of a tower, then the dissatisfaction occasioned by it is imperceptibly lost, and gives place to feelings altogether different. Finally let the hill be raised up so high, that it is almost impossible to embrace it at a glance, then we prize it more than the whole beautiful surrounding plain, and would not, without regret, exchange the impressions which it makes upon us, for any other even equally beautiful scene. Now suppose this mountain to assume such an inclination, that it appears as if it would every moment plunge down, then the former feeling will be mingled with another; horror will unite itself with it, yet the object itself becomes thereby only more attractive. But suppose this inclining mountain were sustained by another, then the terror would be lost, and with it a greater part of our satisfaction. Suppose further that four or five

other mountains were placed near by this, each one of which was a fourth or fifth part lower than the next preceding; then the first feeling with which we were influenced by its greatness, would become sensibly weakened. Something similar would take place, if the mountain were divided into ten or twelve equal formed knobs; also if it were adorned by artistic improvements. Now in the first place we have made no other experiment with this mountain, except increasing its size, leaving it, in other respects, altogether as it was, without changing its form, and by this single circumstance from an indifferent, yes, even repugnant object, we have changed it into an object of satisfaction. By the second experiment at the same time that we have changed this great object into one of terror, we have thereby increased the satisfaction derived from its aspect. By the other experiments which we have tried, we have lessened the horror-stirring peculiarities of its aspect, and thereby weakened the pleasure. We have lessened the idea of its size *subjectively*, partly because we have divided the attention of the eye, and partly because we produced a measure for the same, by placing the smaller mountains at its side, so as to command the size of the mountain more easily. Magnitude and terribleness may also, in certain cases, in themselves alone, serve as a source of pleasure.

In the Grecian mythology there is no more frightful, and at the same time hideous image than the Furies or Erinnys when they arise from Orcus to persecute a criminal. A horrible, distorted countenance, haggard figure, a head covered with serpents instead of hair, revolt so much against our senses, as to offend our taste. But when this monster is represented as it persecutes the matricide Orestes, when it swings the fire brand in its hands, and hunts him restlessly from one place to another, till at last when it has reconciled enraged justice, it disappears into the depths of hell, we linger with an agreeable horror at the spectacle. But not only the anguish of the conscience of a criminal, which becomes sensible to us by means of the Fury, even his disloyal action, the real act of a criminal, may be pleasing to us in its representation. The Medea of the Grecian tragedy Clytemnestra, who murdered her husband, Orestes who killed his mother, fill our nature with a shuddering enjoyment. We discover even in common life that objects which are indifferent to us, yes even repugnant and revolting objects begin to interest us, as soon as they approach either the monstrous or the horrible. A man who is altogether common and insignificant begins to please us, as soon as a strong passion which does not exalt his merit in the least degree, makes him an object of fear and horror. So also a common object, one of which nothing can be said, becomes a source of enjoyment to us, as soon as we increase it until it threatens to surpass our powers of comprehension. An ugly man becomes uglier yet by rage, and still in the outbreak of this passion, provided it is not in a ridiculous man-

ner, but eventuates in being frightful, at that moment, he becomes invested with an extraordinary charm. This remark is applicable even to animals. An ox at the plough, a horse at the cart, a dog, are common objects; but if we excite the ox to battle, if we put a gentle horse in a rage, or if we see an infuriated dog, then these animals become exalted to æsthetic objects, and we begin to observe them with a feeling that borders on pleasure and esteem. The general inclination of all mankind for what is passionate—the power of sympathetic feeling which draws us *in the Nature* at the sight of grief, of alarm, and of horror, which has so much charm for us in Art, which allures us to the theatre, which gives us such a relish for the delineation of great misfortunes—all these things are evidence of *a fourth source of enjoyment* which neither the Agreeable, the Good nor the Beautiful can produce.

All the instances above cited have something *objective* in the feeling which they excite within us common with others. In every case we receive the image of something "that either overcomes, or threatens to overcome our sensuous power of comprehension, or our sensuous power of resistance," while at the same time this pre-eminence does not drive either of the two powers to a depression, neither discourages within us the effort at comprehension or of resistance. A multifarious peculiarity is there presented to us, which drives us to the limits of our faculties of comprehension, in order to embrace them together in unity. A power appears before us here, against which our own disappears, but with which we are compelled to assimilate. Either it is an object which presents itself to, and immediately withdraws from our faculties of comprehension, and arouses an effort to obtain the image, without permitting an entertainment of a hope of satisfaction, or it is an object which appears to rise up in hostility against our existence, challenges us out as it were to battle, and makes us apprehensive about the issue. The same effect is also visible on the faculties of sensibility in all of the above cited cases. All put the disposition of the mind in an uneasy commotion, and on a stretch. A certain earnestness, which may amount to solemnity, takes possession of our soul itself, and while it shows significant traces of anguish in the sensuous organs, plunges the meditating spirit back within itself, and appears to rely on an exalted consciousness of its own self-sustaining power and worth. This consciousness must by all means be overpowering, when the grandeur or horror of it is worthy of æsthetic merit. Now because the disposition of the mind is inspired by such images, and feels itself exalted above itself, we denote it with the name of the *Sublime*, although the object itself objectively, presents nothing sublime, and it were more becoming to call it *exalting*.

When an object may be said to exalt, it must be placed in opposition to our sensuous faculties. But in general we may allow two different relations which the thing may bear towards our sen-

suality, and conformably to these there must be also two different kinds of resistance. Either it is to be viewed as an object of which we would procure a knowledge for ourselves, or contemplated as a power with which we compare ourselves. According to this division there are two kinds of the Sublime, the Sublime of Knowledge, and the Sublime of Power.

But now the sensuous faculties contribute nothing farther towards knowledge, except that they take up the material furnished, and place the manifold variety of the same together in space and time. It is the business of the understanding, and not of the power of the imagination, to separate and classify this manifold variety. There is a *heterogenousness* for the understanding alone. There is a *homogeniousness* for the power of imagination (as Sense) only, and there is also merely the abundance of homogeniousness (the quantity not the quality) which may be distinguished by the sensuous comprehension of appearances. Moreover should the sensuous faculty of perception sink under an object, it must be because the object overwhelms the power of the imagination by means of its quantity. The Sublime of Knowledge is consequently dependent upon the number or greatness, and may therefore also be called mathematical.*

[From the Ciceronean Magazine.]

EARTH'S HIGHEST STATION ENDS IN "HERE HE LIES."

BY MISS M. B. A.

Nature is but a volume inscribed to Change. 'T is revolution all. Where'er through Nature's scenes we look, the lesson is impressed, of vanity and change. Decay and dissolution tinge with evanescence the fair visage of all sublunary objects. Change, as a lordly monarch, exerts an effectual and unlimited sway over earth's wide domain. Night, from her ebon throne, draws her sable mantle over creation's ample dome; and day in turn, sways the sceptre of light, in the expulsion of darkness.

Behold this orb, of whose empire we mortals boast; how marked by change! Summer, glad and beautiful, in the gay habiliments of fresh and exuberant nature, landscapes decked with flowers and green, soon lays on the shrine of Autumn her richest offerings, and, stripped of her insignia of gay but transient empire, yields the scepter and the realm to stern Winter, who founds the glory of his dominion in the conquest of all that Summer had fostered and loved. Heralded by the blighting frosts of Autumn, he comes, and soon

* See Kant's Criticism on the Power of Æsthetic Judgment.

embeds in snow and ice the fields and lawns arrayed in the rich luxuriance of prodigal Summer.

Thus change and revolution have diversified the history of the universe from Creation's birth, when first breathed o'er the chaotic profound the fiat of Omnipotence, rolling into sublime existence and harmonious revolution the wheeling planets, which float in the effulgence of a million suns; when change, the mistress of wonders, swept from the brow of sleeping eternity the pall of darkness. O change! whose mandates all obey; is man too the sport of thy fancy and the victim of thy power? 'T is even so. Though a sovereign prince, a being so august, so rich, so complicate, a bright miniature of etherial greatness, an heir of heavenly glory, a grand and noble "link in being's endless chain;" yet this "lord of creation," in all his magnificence of origin and destiny, is the child of weakness, and the sport of change. Soon must his royalty be laid in the dust. To him, whose fiery and impetuous thought grasps in a moment little less than the idea of the Deity, the narrow vault shall furnish a resting place, where all that is seen of him shall repose in forgetfulness. As all nature expires, so must man expire.

And is it true, that man, the noblest mechanism of God, is to pass so soon away? We must, alas! behold the throne as well as the hovel arrayed in the sack-cloth of morning. The king must relax from obedient nations his mighty sway. The sons of genius and of fame, from their more lofty eminence and firmer grasp of immortality, must descend to the grave. The daughters of beauty and loveliness, whose charms it were sacrilege to assail, must become food for worms. The votaries of wealth, refinement, and fashion, must all be leveled with the meanest slave. Nothing terrestrial can avert the gloomy, dismal end to which all are hastening. Nature recoils at its own destiny, and thus acknowledges an invisible Hand that disposes events.

O grave! how chilling the thought of thy future dominion. Art thou a ceaseless slumber? How vain, then, is ambition! Better to perish without a struggle. Why nerve every power to weave for mortality an immortal robe? How silly, too, is conscience! Its foolish whisperings bid me hope to live again. They have wrought me to yearnings for immortality, whose disappointment must be a second and more dreadful death. Ah! why this feverish longing to be something more than human? No, terrible grave! thou art the entrance to the land where this feverish being shall be unshackled and free. Then come, thou common lot of mortals! Thou hast no terrors for which thy deliverance is not a more than counterpoise.

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H. W. LEFFINGWELL, Notary Public. R. S. ELLIOTT, Com'r of Deeds.

Leffingwell & Elliott,

REAL ESTATE Dealers, Auctioneers and Conveyancers, No. 123 Chesnut street, St. Louis, Mo. Real Estate sold on commission, at private sale, or auction. Also, Deeds of all kinds written, and acknowledgments taken. Maps of the city and additions, to be seen at the office, and information given free of charge. Surveying done promptly and correctly.

Glover & Campbell,

Late of Palmyra, Mo., Attorneys at Law,

SAINT LOUIS.

John C. Meyer,

Dealer in Hides, Leather, Oil, and Findings,

No. 88 North Main Street, St. Louis.

Charless & Blow,

NO. 70 and 72, Exchange Building, St. Louis, Mo., Importers and dealers in drugs, medicines, oils, paints, dye stuffs, perfumeries, window glass, glass-ware, &c.

O. W. Jerome,

WHOLESALE and retail dealer and manufacturer of Cabinet Furniture, chairs, bedsteads, &c., Nos. 44, 46 and 48, Olive street, opposite the Monroe House, Saint Louis, Mo.

Sligo Book Store and Paper Warehouse.

AMOS H. SCHULTZ, No. 136, north Main street, St. Louis, opposite the Bank. Wholesale dealer in books, paper and stationery.

THE undersigned takes the liberty of informing you that he has removed his place of business to Olive street, a few doors above Main, south side, in the Exchange Building, and three doors above Messrs. E. W. Clarke & Co's. Banking House, where he is now opening, and will continue to receive during the Spring months, a large and full assortment of the most

Fashionable Styles of Goods,

In his line, for gentlemen's wear; and where he will be pleased to see his old friends and customers, and their friends with them; and assures those who may favor him with their patronage, that they shall receive his personal attention, and his best efforts to please. Very respectfully, your ob't servant,

J. G. SHELTON.

Giles F. Filley,

MANUFACTURER of the celebrated prize premium cooking stoves; also, Irving's air tight cooking stoves, fancy parlor stoves, fancy box and coal stoves; dealer in tin plate, copper, sheet iron, block tin, rivets, tinner's tools, machines, &c. Warehouse No. 163 north Main street, St. Louis, Mo. Foundry on Lewis street, near the water works.

Clothing at Wholesale.

ARCHIBALD YOUNG & CO., 99 Main street, St. Louis, Mo., Wanzer Minor & Co., 126 Pearl street. Yew York, Moses Wanzen and Henry J. Minor, New York, Archibald Young, St. Louis.

N. B.—We manufacture all of our own goods, and sell at the lowest possible prices

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Fallon & Wright,

CARRIAGE mamufacturers and dealers, No. 90, Fifth street, between St. Charles and Locust, are constantly manufacturing, and have on hand, all styles of carriages, which they will sell on the most reasonable terms. They flatter themselves from the experience they have had in the business, to be able to furnish as good an article as can be bought in any market. Citizens and strangers are requested to call and examine for themselves. All carriages made by us are warranted to be as represented, or the money refunded. WESLEY FALLON,

JAS. A. WRIGHT.

Washington Foundry.

CORNER of Second and Morgan streets, St. Louis, Mo. We are prepared to fill with dispatch, and to fit up in superior style, all orders in the Foundry and Machine business, such as steam engines, mill work, mill castings, railroad cars, wheels for coal trucks, lard and soap kettles of all sizes, press screws, &c., made to order at short notice. Wool carding machines, shearing machines, and a large and superior stock of machine cards, we will warrant equal to any in the Union.

All orders from the country will meet with prompt attention.

J. T. DOWDALL & CO.

Doan, King & Co.

WHOLESALE Dry Goods dealers, 131 and 133 Main street, St. Louis. Job P. Doan, St. Louis, Wylley King, do., Richard Bigelow, New York.

Crow, McCreery & Co.,

WHOLESALE dealers in Dry Goods, No. 71 Main street, St. Louis Mo. Wayman Crow, Phoceon R. McCreery, Wm. H. Barksdale, Wm. A. Hargudine, Charles D. Appleton.

Great Western Clothing Emporium!

WHOLESALE AND RETAIL,

No. 124 *and* 126 *Second street, corner of Vine.*

W. L. & J. BIGELOW & Co., St. Louis, Mo.

BAKER, NELSON & Co., 51 Cedar street, New York.

Thomas Grey,

BLACKSMITH and Iron Worker, No. 90 North Second Street, between Olive and Locust, St. Louis Mo. Keeps constantly on hand, and manufactures to order, Ox Chains, Sledges, Wedges, and every description of Mining Tools, also Iron Hobbles and Picket Pins. ☞Blacksmith work for Housebuilders, at the lowest prices. ☞He has always on hand, the highly recommended *Iron Frame Bedstead, and Camp Stool.*

General Agency at Dubuque, Iowa.

FOR Public Lands—Real Estate—Military Land Warrants—Payment of Taxes—Investigation of Titles—Amicable Collection of Debts, and all other business within the legitimate sphere of an Agents duties, by

CHARLES CORKERY,

Notary Public and Commissioner of Deeds and Depositions for all the North-western States, Missouri, included.

October, 1850.

Fruit Trees and Shrubbery,

FOR sale by JOHN SIGERSON & BROTHERS, at their fruit farm and nursery. This establishment is located seven miles South of St. Louis, Mo. There are Omnibus Coaches running daily from the City within one half mile of the establishment. The Nursery and Gardens are open at all times (Sundays excepted) for the reception of visitors. Horticulturists and Amateurs are respectfully invited to visit the establishment and examine for themselves. In directing the attention of the public to their nursery, they would remark that one of the firm, (Mr. James Sigerson,) has been engaged in the above business for the last twenty-five years; during that time he has tested many of the varieties now growing. This, with the assurance on their part of an intention to increase the number of their trees, as well as to add to their assortment from year to year, furnishes a strong guarantee to persons wishing to make choice selections of fruit, that they can always be supplied. Their prices for trees will be as reasonable as at any similar establishment East or West, and when desired, trees will be delivered free of charge in the city or on steamboats; packed in good order for their destination.

☞All letters addresed to John Sigerson, St. Louis, or to James Sigerson, Carondelet, will meet with prompt attention.

JOHN SIGERSON & BROTHERS.

M. PAWLEY. H. B. HAWKINS.

Pawley & Hawkins,

MANUFACTURERS OF FIRE PROOF VAULTS, Safes, Iron Window Shutters and Doors, cast and wrought iron railings, and all kinds of ornamental iron work. Also, heaters for public and private buildings.

In the manufacture of iron railing, either wrought or cast, over five hundred designs in their possession may be examined, embracing all the most beautiful patterns of the eastern countries, public and private buildings.

Every article in their line, made with despatch; and warranted equal to any manufactured in the United States. No. 118 Third street, St. Louis, Mo.

ROLIN CLARK, } { PHILANDER BRALEY,
JOHN RENFREW, } { ALEXANDER CROSIER.

Eagle Foundry and Engine Shop.

NORTH west corner of Main and Biddle streets. Manufacturers of all kinds of machinery, boilers and sheet iron work, portable circular saw mills always on hand, all orders executed with fidelity and despatch.

Home Mutual Fire and Marine Insurance Company of St. Louis.

NOTWITHSTANDING the heavy loss sustained by this company in May last the stock notes now on hand amount to $350,000. The stock notes of the company are secured by lien upon real estate and approved endorsers. Office, No. 120 North Third street.

Directors:—I. L. Garrison, A. P. Ladew, P. Salisbury, John Whitehill, Jos. A. Eddy, Henry Kayser, D. D. Page, Theron Barnum, John Kern.

ISAAC L. GARRISON, President,

D. D. PAGE, Treasurer,
PHILANDER SALISBURY, Secretary.

John S. Watson,

(Late of Wilgus & Watson.)

NO. 51½ 40' Pine street, between 2d and 3d, next door above the old stand of Wilgus & Watson, house, steamboat, sign and ornamental painter, grainer, glazier, whitener and paper hanger; also, dealer in all the latest styles of French and American paper hangings. He keeps constantly on hand and ready for sale mixed paints of all colors, oils, varnishes, Japan, turpentine, white lead, putty, and a large and superior assortment of French and American window glass, which will be cut to any size to suit customers.

☞ Particular attention paid to estimating on houses or steamboats. nov.

Saint Louis Furniture Store,

WM. M. HARLOW, proprietor. Manufactures and keeps constantly on hand every variety of household furniture, matresses, window blinds, willow ware, &c., &c.

Also, manufactures to order every article in his line, with despatch. Orders from abroad promptly attended to, and goods carefully packed. All goods warranted as recommended.

New Warehouse, No. 88 Second street, between Olive and Locust streets, St. Louis, Mo.

New Madrid County Records.

PERSONS wishing to obtain transcripts of records in New Madrid county, can procure them without delay by addressing the undersigned. And to avoid the inconvenience of remitting small sums, the records will be directed to George Pegrim & Co., St. Louis, who will deliver the same upon the payment of the fees.

WM. MOSELEY.

March, 1851. Recorder of New Madrid County, Mo.

Missouri State Mutual Insurance Company.

DIRECTORS:—John O'Fallon, C. M. Valleau, Reuben Knox, Daniel D. Page, Oliver Bennett, John Sigerson, John S. McCune, Joseph A. Eddy, True W. Hoit.

This company is established upon the mutual principles of insurance, and is emphatically a home institution. The fire risks of this company are extended into all parts of this State. Its earnings are never employed or invested in stocks or real estate, but kept for the prompt liquidation of losses, and under the immediate control of the Directors. Every person insuring with this company becomes interested in its success, and its profits instead of being divided among a few stockholders, belong to those who insure in this company.

The Directors aware of the importance of a well secured fund, reliable in case of loss, and ample under all ordinary calamity, assure the public that they have already a pledged fund, ample and reliable for any contingency, with a monthly increase of premiums of over ten thousand dollars. For the length of time this company has been in operation (six months) its business has been extended into all parts of the State and the city, and has received from the public a liberal patronage, which has placed it upon a permanent basis.

By an act incorporating this company, the parties insuring property therein, are entitled to the entire profits of the institution, the premium notes are also pledged by the charter for the payment of losses.

The portfolio of the company is at all times open to the inspection of its members and those wishing to make insurance with it. Policies are issued from thirty days to six years, thereby effecting a permanent insurance, with a return premium of from fifteen to fifty per cent, according to the term of insurance.

Agents for this company, may be found in all the principal towns in the State to whom application may be made.

Office of the company over E. W. Clark & Brother, corner of Main and Olive streets, Exchange building, where insurance will be effected at the tariff rates of premium.

C. M. VALLEAU, President,

H. D. BACON, Treasurer.

S. F. LEDYARD, Secretary.

John Loughborough,

ATTORNEY AND COUNSELLOR AT LAW,

OFFICE—No. 56 Pine street, near Third, (adjoining that of the Clerk of the Supreme Court.)

Woods, Christy & Co.,

WHOLESALE dealers in Dry Goods, No. 75 Main street, St. Louis, Mo.
James Woods, William T. Christy, James C. Christy, Robert K. Woods.

J. Henwood,

Hat Manufacturer, 72 Chesnut Street, St. Louis, Missouri.

Wolf & Engert,

IMPORTERS and Dealers in Paper-Hangings, colors and Fancy Papers, No. 49 South Second street, between Elm and Myrtle, St. Louis, Mo. Constantly on hand, all kinds of Oil and Water Colors, Paper-Hangings, Chimney Screnes, Tester Pieces, Window shades, Marble, Marroquin, Gold and Silver Paper, Painters' and Dutch Gold Bronze, Lead Pencils, Paint Boxes, Paint Brushes, Drawing Paper &c.

April, 1850.

F. Dings & Co.,

IMPORTERS of German, French and English Fancy Goods, and Manufacturers of all kinds of

BRUSHES.

No. 47, Main street, St. Louis, Mo.

THE BANKING HOUSES OF ST. LOUIS.

D. D. PAGE. E. D. BACON.

Page & Bacon,

Banking House, No. 139 *Main street, St, Louis; next door to the Bank of Missouri.*

N. B. Deposits received, Drafts and Notes from all parts of the Union collected, and exchange on the East and South for sale at all times.

Also, Branches of Exchange and Banking Houses at San Francisco and Sacramento Cities, California.

Loker, Reneck & Co.,

Bankers and Exchange Dealers, No. 132 *Main st., west side, third door north of Pine st., St. Louis, Mo.*

Interest paid to depositors, drafts and notes collected, sight and time bills purchased and sight exchange on the eastern cities and New Orleans for sale at the lowest rates in sums to suit purchasers.

John J. Anderson & Co.,

Bankers and Exchange Dealers, on the North-West corner of Main and Olive streets, St. Louis Mo.

Interest paid to depositors, drafts and notes collected, sight and time bills purchased and exchange on the eastern cities and New Orleans for sale at the lowest rates.

L A. Benoist & Co.,

Bankers and Exchange Dealers, No. 83 *Main st., east side, third door north of Olive st.. St. Louis, Mo.*

Interest paid to depositors, drafts and notes collected, sight and time bills purchased, and sight exchange on the eastern cities and New Orleans for sale, at the lowest rates, in sums to suit purchasers.

S. HASKELL. JA'S. E. FRANCISCUS. J. H. BILLING.

EXCHANGE BANK.

Haskell & Co.,

Bankers and Exchange Dealers, corner of Main and Vine Streets,
ST. LOUIS. MO.

BUY and sell exchange on all the eastern, western, and southern cities; all kinds of bank notes, and Foreign Gold and Silver.

☞ Land warrants bought and sold, and fully guaranteed.

☞ Collections made on all cities, and promptly remitted for, at current rates of exchange, *free of charge.*

☞ Interest allowed on deposits on time, or to be checked for at sight.

The highest price paid for Gold Dust.

JOHN HOW. WM. CLAFLIN. ROBT. COOK. JNO. A. ALLEN.

How, Claflin & Cook,

DEALERS in Boots and Shoes, Hides, Leather, Shoemakers' Findings, Tanners' Oil, Curriers' Tools, &c, .412 Main Street, (opposite the Bank,) St. Louis, Mo. April, 1851.

C. M. & H. M. Warren,

MANUFACTURERS of Warren's Improved Fire and Water-Proof Composition Roofs, and Roofing Materials, which are kept constantly on hand and for sale (with directions for use) to those in the country who may desire to adopt this mode of roofing.

Office and Manufactory, East side Second Street, between Almond and Poplar, St. Louis, Mo. Office Hours from 10 to 11 o'clock A, M. and 4 to 5 P. M.

Jonathan Jones'

COMMERCIAL COLLEGE, ST. LOUIS, MO.

Incorporated by the General Assembly, January 24, 1849,

WITH full authority "to grant diplomas, award degrees, confer honors, and exercise all and singular, the privileges common to Commercial Colleges, authorized by law in other States."—Charter, Sec. 2.

JONATHAN JONES, Master of Accounts—President and acting Professor of theory and practice of book-keeping, commercial calculations, commercial correspondence, etc., etc.

JAMES W. RICHARDSON, Practical Accountant—Permanent Associate in book-keeping Department.

CHARLES STEWART, Professor of Mathematics—In special charge of commercial calculations.

FLETCHER M. HAIGHT, Esq., Professor of Commercial Law.

JOSEPH P. HORTIZ, Professor of Penmanship.

N. B.—For information in regard to the terms, the course of instruction, and all business connected with the above, call at the "Book-keeping Department," corner of Fourth and Chesnut streets, or address Jonathan Jones, St. Louis, Mo.

The St. Louis Union

BOOK AND JOB PRINTING ESTABLISHMENT,

No. 35 Locust Street between Main and Second, St. Louis Mo.

JOHN D. M'MURRAY. JAMES M. DORMAN.

M'Murray & Dorman,

IRON Railing Manufactory corner of Third and Pine streets continue to manufacture at the above establishment, all kinds of Plain and Ornamental Iron Railing, Balconies, Bank and Jail Doors, Book Safes, Fire-Vaults, Iron Window Shutters, Iron Awnings, Lightning Rods, Bedsteads, Gratings, and in fact, any thing which can be formed of Iron.

John Mullery,

PREMIUM Horse Shoer, in the alley, opposite the Post Office, will as usual pay particular attention to the various disease effecting the feet of horses, and will guarantee to give general satisfaction in either of the above departments.

M. Tarver,

ATTORNEY AND COUNSELLOR AT LAW,

No. 97 Chesnut Street, St. Louis,

(TWO DOORS WEST OF THE POST OFFICE.)

T. F. Risk.

ATTORNEY AND COUNSELLOR AT LAW,

Office—No. 97 Chesnut Street,

St. Louis, Mo.

Charles & Hammond,

BOOK AND JOB PRINTERS,

Chesnut Street,

St. Louis, Mo.

Slate Yard.

JOHN M. CANNON, Slater,

No. 15 and 17 South Sixth street, St. Louis,

WOULD respectfully inform the public that, having now completed his arrangements, he is prepared to make contracts for any work in his line. He has in his employ practical slaters, and is well prepared to execute in a workmanlike manner, and with dispatch, all orders entrusted to his care. He keeps constantly on hand, and for sale, Welsh slate, ridge tiles, sheet lead, slate flagging, slate hearths, copper, brass and iron slating nails, Rosendale cement, and all other articles pertaining to his business. He will strip from roofs, zinc, sheet iron, tin, or other covering, and substitute therefor slate. Slate removed from one roof, can be used to advantage on another, which is not the case with any other roofing material. His terms are such as cannot but prove satisfactory. Apply as above.

THE WESTERN JOURNAL,

PUBLISHED MONTHLY.

DEVOTED TO

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The Western Journal is designed to embrace every subject connected with Agriculture, Commerce, Manufactures, Mechanic Arts, Mines, and Internal Improvement.

A portion of the work will be appropriated to Statistics, which will be collected and arranged with reference to the leading subjects contained in the respective numbers.

The development of the vast resources of the valley of the Mississippi, and the improvement of the intellectual and social condition of its inhabitants, will be constantly kept in view; and the leading article of each number will be devoted to the advancement of these objects. In attempting to illustrate and give direction to the economy connected with the leading pursuits of the country, the Editors have undertaken more than has been done, or proposed by any other journal with which they are acquainted. And it is by their labors in this department, mainly, that they expect to make the work useful.

Contributions are solicited on all subjects properly embraced in the design of the work.

☞ Clubs, composed of three individuals, will be furnished with the Western Journal at the rate of $2,50 per annum. Five at $2.00.

☞ Owing to the enlargement of the work, six numbers will hereafter constitute a volume, and a general Index will be made out to accompany the 6th and 12th numbers.

☞ Publishers of Newspapers who will insert the foregoing prospectus in their papers, once in three months, will be furnished with the work for one year.